

# A Stereo-Atlas of Ostracod Shells

edited by P. C. Sylvester-Bradley and David J. Siveter



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## INSTRUCTIONS TO AUTHORS

Contributions illustrated by scanning electron micrographs of Ostracoda in stereo-pairs are invited. Full instructions may be obtained on request from the Editors. Format should follow the style set by the majority of papers in this issue. The Editors should be consulted for advice before figures for plates are mounted. Descriptive matter apart from illustrations should be cut to a minimum; preferably each plate should be accompanied by one page of text only.

Department of Geology, The University, Leicester.

Erratum: The year of issue on the spine of this part should read 1975 and not 1974.

### STEREO-VIEWING FOR USERS OF THE ATLAS

In order to gain maximum information and benefit from the use of the *Stereo-Atlas* it is *essential* that the user view the micrographs stereoscopically. Small pocket-sized stereo-viewers are most suitable for this purpose. Two suppliers are:

C. F. Casella & Co. Ltd., Regent House, Britannia Walk, London, N1 7ND, and  
Air Photo Supply Corp., 158, South Station, Yonkers, New York 10705.

The scanning electron microscope in the Department of Geology of the University of Leicester was supplied by the Natural Environment Research Council under the terms of Grant No. GR/3/95 for the purpose of micropalaeontological research. Editorial expenses are supported by N. E. R. C. Grant No. GR3/2198.



ON *CLUTHIA KEIJI* NEALE sp. nov.  
by John W. Neale  
(University of Hull, England)

*Cluthia keiji* sp. nov.

1973 *Cluthia cluthae* (Brady, Crosskey & Robertson, 1874); J. W. Neale, *J. Paleont.*, vol. 47, no. 4, pp. 684-686 (pars), pl. 1, figs. 2-4 (non figs. 1, 5-11).

Holotype: University of Hull coll. no. HU.130.R.1, ♂ RV.

[Paratypes: University of Hull coll. nos. HU.130.R.2-7, HU.130.R.8.1-6, and 18 specimens T192-193 in the University of Utrecht coll., Holland].

Type locality: Mediterranean off E Spain, long. 0°38'20.5"E, lat. 40°08'36"N. Depth 81 m. Recent.

Derivation of name: In honour of Dr. A. J. Keij who first drew my attention to this material.

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Explanation of Plate 2:23:142

Fig. 1, ♀ RV, ext. lat. (HU.130.R.2, 276 µm long); fig. 2, ♂ RV, ext. lat. (HU.130.R.1, 286 µm long).

Scale A (100 µm ; ×338), figs. 1, 2.

Figured specimens: University of Hull coll. nos. HU.130.R.1 (♂ RV: Pl. 2:23:142, fig. 2; Pl. 2:23:148, fig. 2), HU.130.R.2 (♀ RV: Pl. 2:23:142, fig. 1), HU.130.R.3 (♀ LV: Pl. 2:23:144, fig. 1; Pl. 2:23:148, fig. 1), HU.130.R.4 (♀ RV: Pl. 2:23:144, fig. 2; Pl. 2:23:148, fig. 3), HU.130.R.5 (♀ LV: Pl. 2:23:146, fig. 1), HU.130.R.6 (♀ car.: Pl. 2:23:146, fig. 2).

All specimens are from the type locality.

Diagnosis: A small, non-tuberculate species of *Cluthia*.

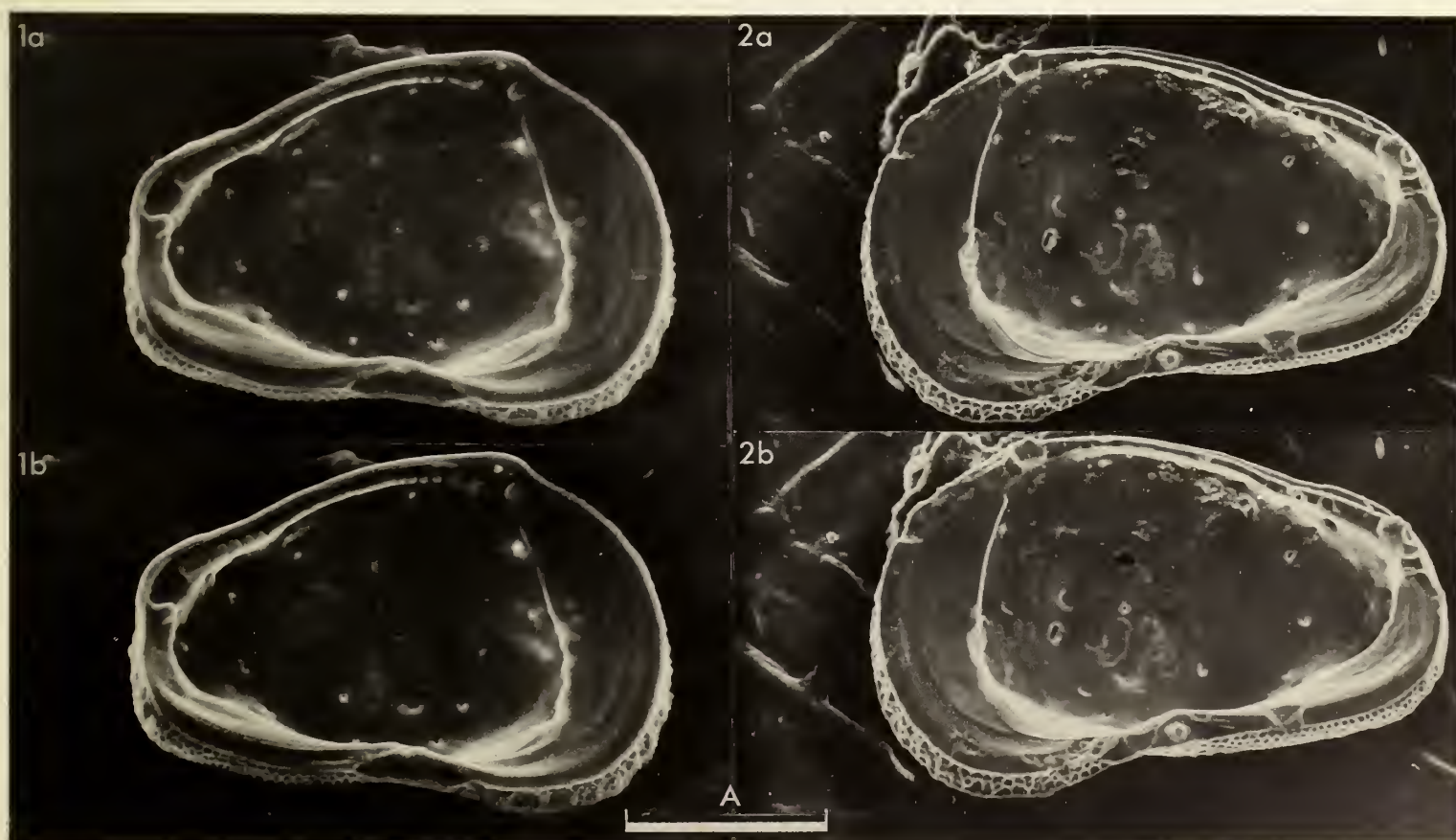
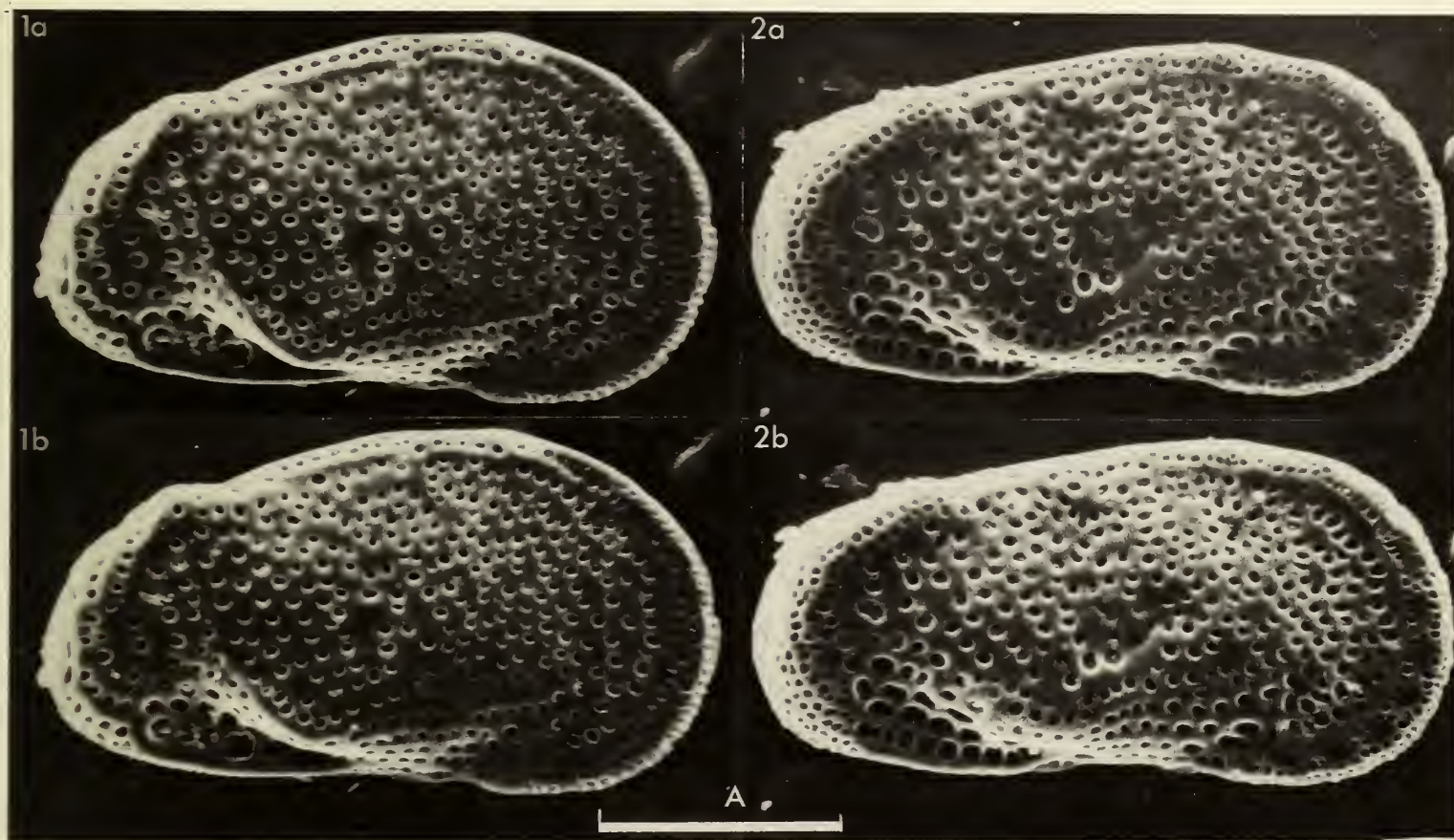
Remarks: Off Spain, the commonest associates of *C. keiji* are *Leptocythere multipunctata multipunctata* (Sequenza), *Callistocythere* sp., *Cytheropteron* (*C.*) *crassipinnatum* (Brady & Norman) sensu Puri et al., *Eucytherura mistrettai* Sissingh, *Hemicytherura defiorei* Ruggieri and *Buntonia* (*B.*) *sublatissimum sublatissimum* (Neviani) for which information I am indebted to Dr. Keij. A single male left valve (0.279 mm long) has also been found in Quaternary deposits 30 m below the sea-floor (depth 93 m) off Malta at long. 14°58'20"E, lat. 35°39'30"N. Dr. I. Yassini has kindly sent me a S.E.M. photograph of a single left valve which he obtained from recent sediments in Bou-Ismaïl Bay (W of Algiers). The pitting is less impressed than in the material off Spain, but its density and pattern is very similar and there is little doubt that Dr. Yassini's specimen is a female of the present species.

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Explanation of Plate 2:23:144

Fig. 1, ♀ LV, int. lat. (HU.130.R.3, 273 µm long); fig. 2, ♀ RV, int. lat., showing prominent ventral "snap-knob" (HU.130.R.4, 299 µm long).

Scale A (100 µm ; ×275), figs. 1, 2.







Remarks (contd.): These small Mediterranean specimens (0.273-0.299 mm long) show sexual dimorphism and resolve a problem noted by Neale (op. cit.). Rare specimens from off N Norway (0.331 mm long) and from the Celtic Sea (0.299-0.305 mm long) were generally smaller than typical *C. cluthae* and lacked tuberculation. They were tentatively interpreted as juveniles of the latter species. They are now seen to belong in *C. keiji* which ranges from the western Mediterranean to almost 70°N. Over this range there is an increase in size northwards to reach a maximum length of 0.331 mm (adult *C. cluthae* commonly range in length from 0.364-0.392 mm).

Distribution: W Mediterranean and E Atlantic, Recent and Quaternary.

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Explanation of Plate 2:23:146

Fig. 1, ♀ LV, ext. lat. (HU.130.R.5, 280 µm long); fig. 2, ♀ car., ext. dors. (HU.130.R.6, 299 µm long).

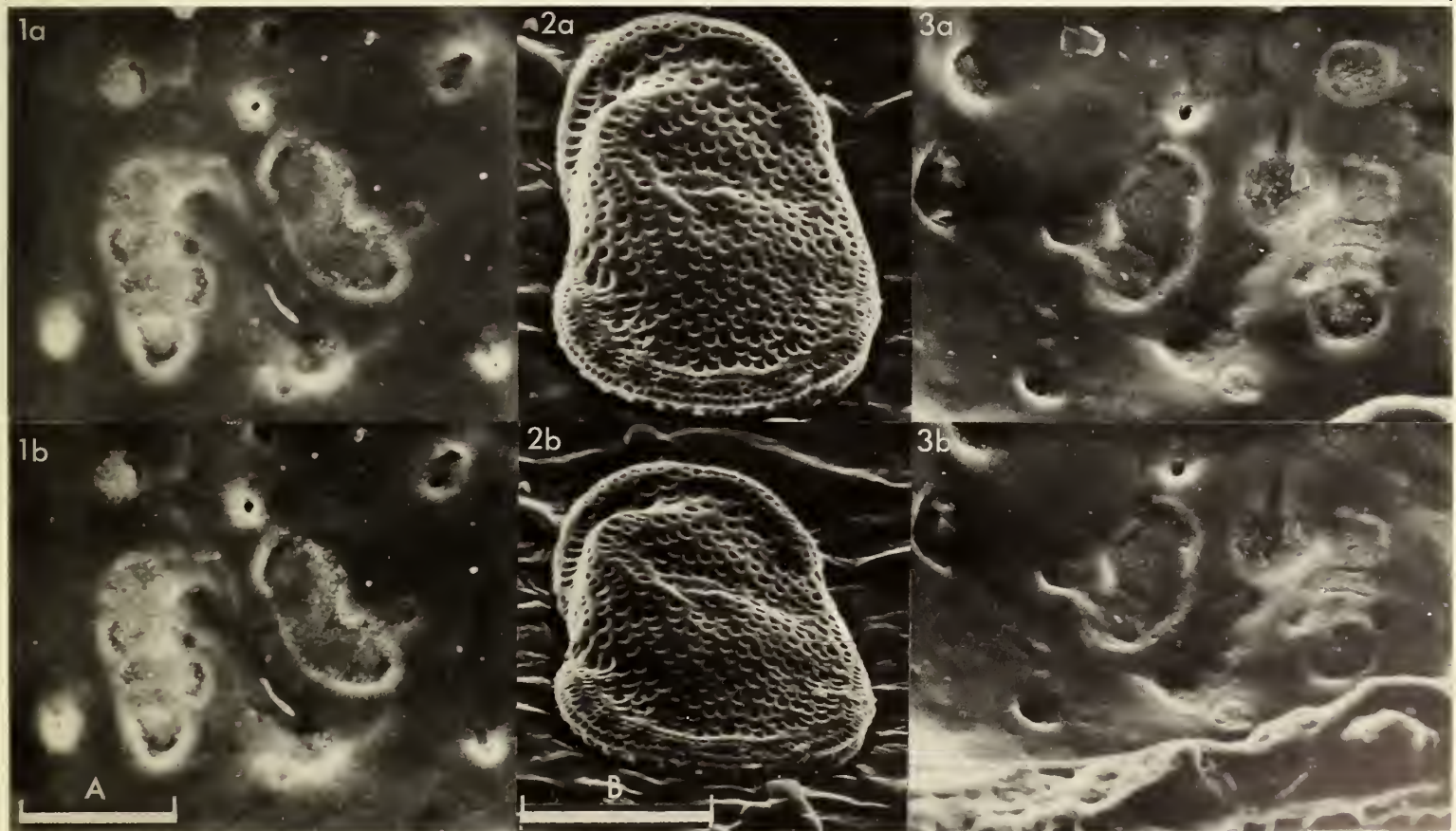
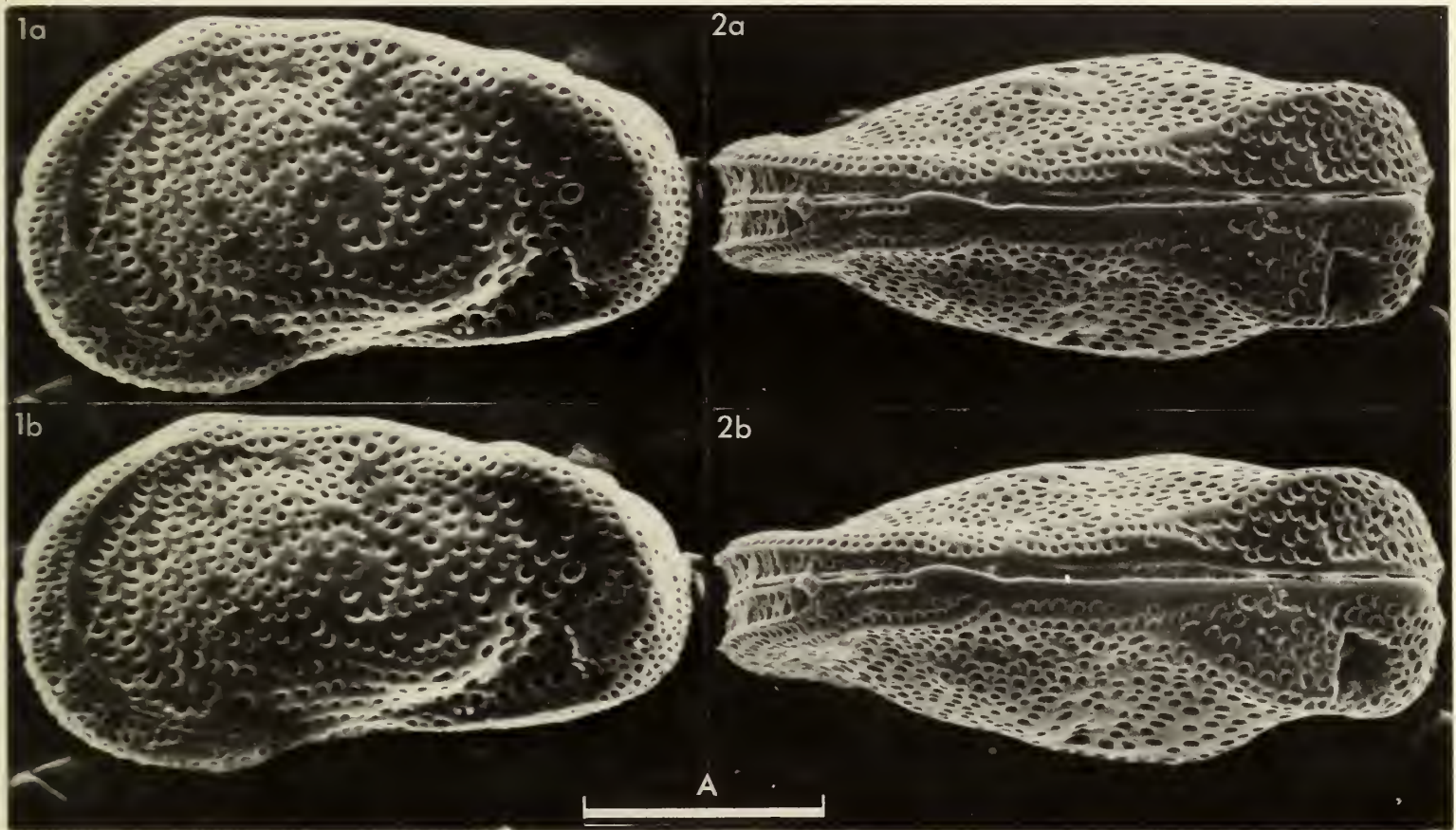
Scale A (100 µm ; ×336), figs. 1, 2.

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Explanation of Plate 2:23:148

Fig. 1, ♀ LV, int. musc. sc. (HU.130.R.3); fig. 2, ♂ RV, ext. ant. obl. (HU.130.R.1); fig. 3, ♀ RV, int. musc. sc. (HU.130.R.4).

Scale A (25 µm ; ×880), figs. 1, 3; scale B (100 µm ; ×272), fig. 2.







ON *HIRSCHMANNIA VIRIDIS* (O. F. MÜLLER)  
by John E. Whittaker  
(British Museum (Natural History), London)

Genus *HIRSCHMANNIA* Elofson, 1941

Type-species (by original designation): *Cythere viridis* O. F. Müller, 1785

**Diagnosis:** Carapace compressed in dorsal view, kidney-shaped in lateral view; ventral margin concave in oral region. Eye-spot distinct. Hinge gongyodont, similar to *Loxoconcha*, but with smooth median element. Wide anterior and posterior vestibules.

**Remarks:** *Hirschmannia* appears to be represented by only one species, the type, *H. viridis*. This is clearly separated from *Loxoconcha* Sars, 1866, on account of the smooth (rather than crenulate) median bar of its gongyodont hinge and in the wide development of the anterior and posteroventral vestibula. Soft-parts are also distinct (see Elofson, op. cit., p. 333). *Loxoconcha tamarindus* (Jones, 1857), included in *Hirschmannia* by Wagner, 1957 (*Sur les Ostracodes du Quaternaire récent des Pays-Bas* etc., Mouton & Co., The Hague, p. 69, pl. XXX), has the soft-parts of a *Loxoconcha*.

Explanation of Plate 2:24:150

Fig. 1, post-maturation moult car., ext. lt. lat. (1974.130; 580 µm long); fig. 2, ♀ car., ext. lt. lat. (1974.131; 480 µm long); ♂ car., ext. lt. lat. (1974.132; 460 µm long).

Scale A (100 µm ; ×120), figs. 1-3.

*Hirschmannia viridis* (O. F. Müller, 1785)

- 1785 *Cythere viridis* sp. nov. O. F. Müller, *Entomostraca seu Insecta Testacea, quae in aquis Daniae et Norvegiae reperit, descripsit et iconibus illustravit*, Lipsiae et Havniae, p. 64, pl. VII, figs. 1, 2.  
1905 *Cythere cyamos* sp. nov. A. M. Norman, *Ir. Nat.*, vol. 14, p. 144.  
1912 *Loxoconcha sarsii* sp. nov. N. Hirschmann, *Acta Soc. Fauna Flora fenn.*, vol. 36, no. 2, p. 22, pl. II, figs. 20-25.  
1941 *Hirschmannia viridis* (O. F. Müller); O. Elofson, *Zool. Bidr. Upps.*, vol. 19, p. 332 (q.v. for detailed synonymy).

**Type specimens:** According to Elofson, (op. cit., p. 332) the collections of O. F. Müller in the Zoological Museum, Copenhagen, no longer exist. Type locality not given, but probably the E coast of Denmark; associated with marine algae.

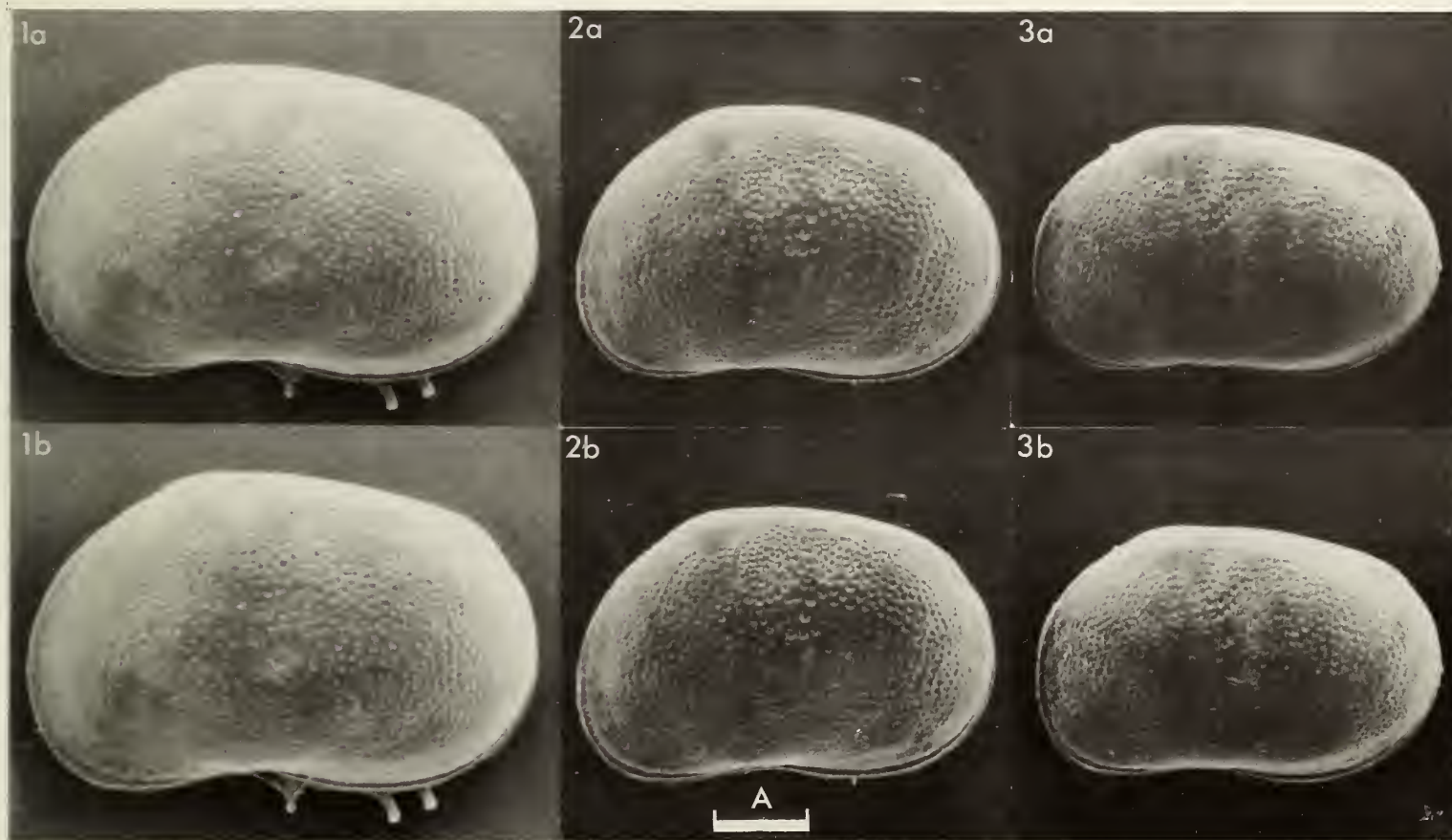
**Diagnosis:** Adults small. Valves finely pitted. Males more elongate and thinner.

**Figured specimens:** Brit. Mus. (Nat. Hist.) nos. 1974.130 (post-maturation moult, car.: Pl. 2:24:150, fig. 1), 1974.131 (♀ car.: Pl. 2:24:150, fig. 2; Pl. 2:24:156, figs. 3, 4), 1974.132 (♂ car.: Pl. 2:24:150, fig. 3; Pl. 2:24:156, fig. 1), 1974.133 (♀ car.: Pl. 2:24:152, fig. 1), 1974.134 (♂ car.: Pl. 2:24:152, fig. 2), 1974.135 (♀ car.: Pl. 2:24:152, fig. 3), 1974.136 (♂ LV: Pl. 2:24:154, fig. 1), 1974.137 (♂ LV: Pl. 2:24:154, fig. 2), 1974.138 (♂ RV: Pl. 2:24:154, figs. 3, 4), 1974.139 (♀ LV: Pl. 2:24:156, fig. 2).

Explanation of Plate 2:24:152

Fig. 1, ♀ car., ext. dors. (1974.133; 490 µm long); fig. 2, ♂ car., ext. dors. (1974.134; 470 µm long); fig. 3, ♀ car., ext. vent. (1974.135; 500 µm long).

Scale A (100 µm ; ×130), figs. 1-3.







Figured specimens: Recent (living when collected). From a sample of the red coralline alga (contd.) *Corallina officinalis* L., taken in a rock-pool at Osmington Mills, Weymouth Bay, S England (approx. long. 2°23'W, lat. 50°38'N); salinity 34‰, water-temperature 5°C; coll. author, 2nd March 1969.

Remarks: The synonymy of this species, much confused in the last century, was greatly elucidated by Elofson (op. cit., p. 332). In brief, authors were never sure how to distinguish *H. viridis* from the juveniles of *Cythere lutea* O. F. Müller, 1785; they also confused it with *Loxoconcha rhomboidea* (Fischer, 1855) and *L. elliptica* Brady, 1868. Norman (op. cit., p. 144), justifying the erection of his new name *Cythere cyamos*, writes ... "I had for some time thought that this was the young of *C. lutea* ... yet it has not quite the same form. Sars [1866, *Forh. VidenskSelks. Krist.*, p. 30] referred this species to the *Cythere viridis* of Müller, but I regard Müller's species as that which Prof. Brady used to name *Loxoconcha elliptica*". Hirschmann (op. cit., p. 22), who had evidently not seen Norman's paper, was of a similar conviction and gave it yet another name *Loxoconcha sarsii*. Today the brackish-water species *L. elliptica*, and the predominantly marine phytal species *L. rhomboidea* and *H. viridis* are universally recognised as distinct and thus *cyamos* and *sarsii* are rejected junior synonyms.

#### Explanation of Plate 2:24:154

Fig. 1, ♂ LV, int. lat. showing soft-parts (1974.136; 480 µm long); fig. 2, ♂ LV, int. lat. (1974.137; 480 µm long). Figs. 3, 4, ♂ RV, int. lat. (1974.138; 460 µm long): fig. 3, ant. hinge; fig. 4, post. hinge.

Scale A (100 µm, ×130), figs. 1, 2; scale B (25 µm, ×450), figs. 3, 4.

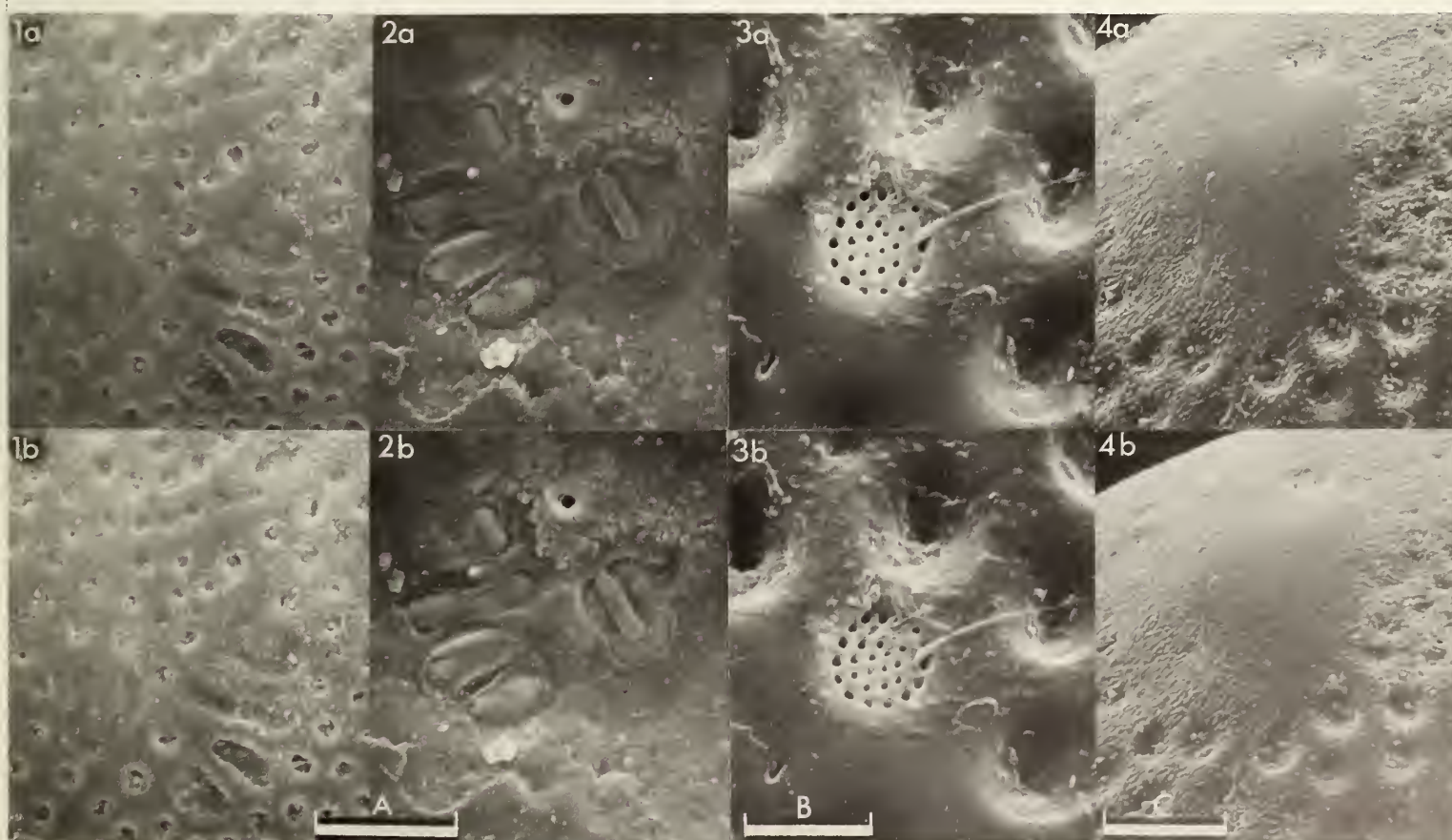
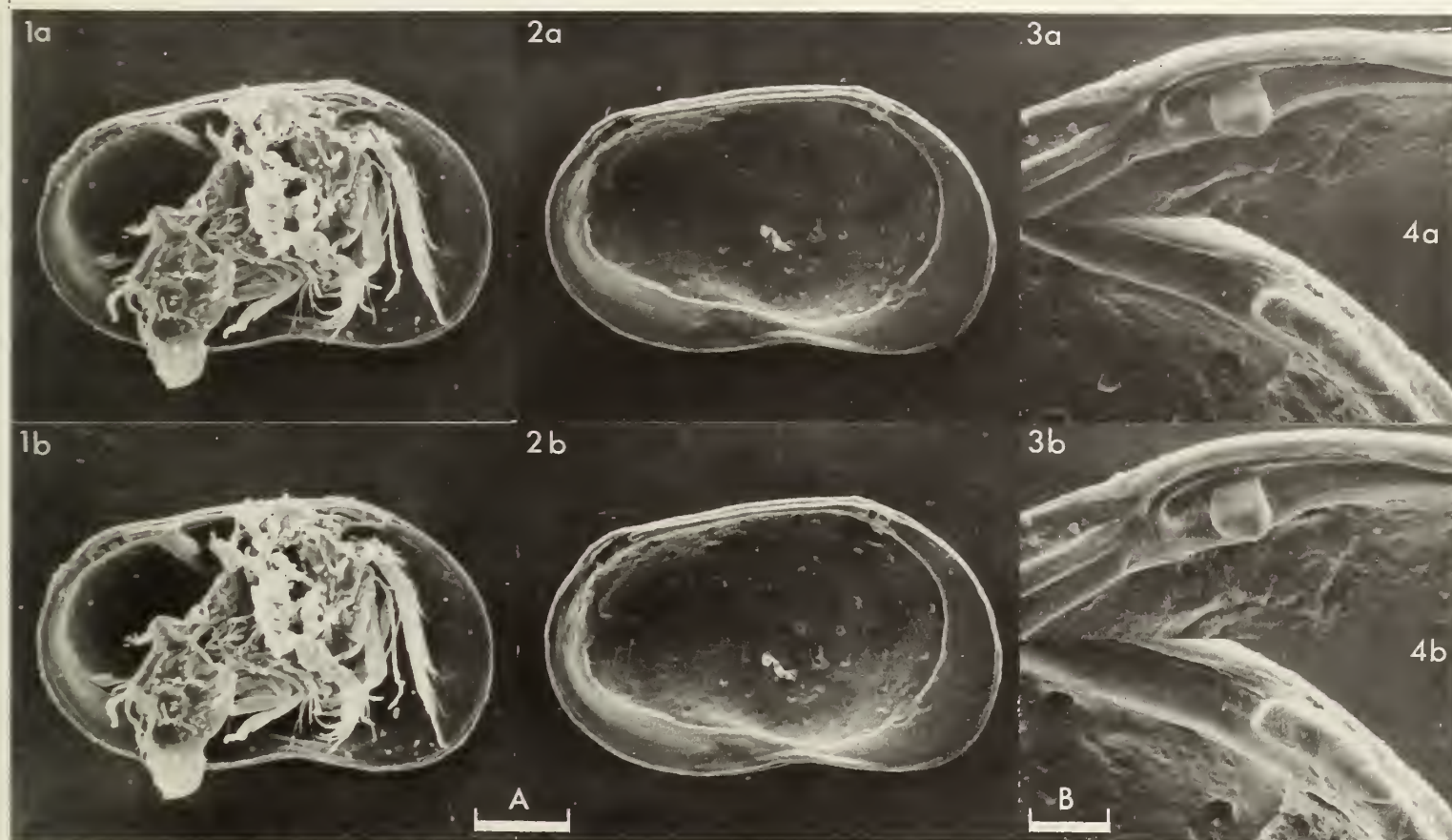
Remarks (contd.): From the 1,750 living adult specimens of *H. viridis* collected from the Fleet and Weymouth Bay, Dorset, S England, the mean length for the female carapace was approximately 0.48 mm and 0.47 mm for the male. Plate 2:24:150, figs. 2, 3, show a typical female and male from a large population in a Weymouth Bay rock-pool; Pl. 2:24:150, fig. 1, however, is of interest in that it shows an adult (of length 0.58 mm) which has clearly entered a further growth stage. The only other example of this rare occurrence of a post-maturation moult, in my study of some 60 living species, was of a specimen of *Paradoxostoma pulchellum* Sars, 1866.

Distribution: Ecology: The life history and ecology of *H. viridis* is very well known (see particularly Hagerman, 1969, *Ophelia*, vol. 7, pp. 79-99). It is a phytal species occurring mainly in the weed-rich littoral fringes of the coasts of NW Europe, often penetrating brackish-water, where green-algae are present. In the Baltic Sea it can tolerate a salinity as low as 2-3‰. Living records suggest a geographical distribution from the Arctic coasts of Scandinavia in the N, to SW France in the S. The species has one population cycle per year, the adults being confined to the winter months. Winter and Spring collections of ostracods, at least on the S coast of England, are generally overwhelmingly dominated by *H. viridis*.  
Stratigraphical range: Pleistocene-Recent.

#### Explanation of Plate 2:24:156

Fig. 1, ♂ car., ext. lt. lat. (1974.132), musc. sc. pattern interfering with punctuation; fig. 2, ♀ LV, int. musc. sc. (1974.139; 500 µm long); fig. 3, ♀ car. (1974.131), sieve pore, post. dors. region; fig. 4, ♀ car. (1974.131), ant. dors. region showing eye-spot.

Scale A (50 µm; ×400), figs. 1, 2; scale B (10 µm; ×1800), fig. 3; scale C (25 µm; ×700), fig. 4.







ON *LOPHOCY THERE* (*LOPHOCY THERE*) *OSTREATA* (JONES AND SHERBORN)  
by Carol Mayes  
(*British Museum (Natural History)*, London)

Genus *LOPHOCY THERE* Sylvester-Bradley, 1948

Type-species (by original designation): *Cytheridea ostreata* Jones and Sherborn, 1888

**Diagnosis:** Rectangular, dimorphic genus of Progonocytherinae with highly ornamented carapace. Ornamentation consisting of ridges, reticulations and prominences. Hinge entomodont. Duplicature without a vestibule. Muscle scars with four oval adductor scars and a circular or oval frontal scar.

Subgenus *LOPHOCY THERE* Sylvester-Bradley, 1948

**Diagnosis:** Subgenus of *Lophocythere* with prominent L-shaped ridge extending from the eye tubercle and paralleling anterior and ventral margins. Area of valve above the ridge ornamented with prominences or ribs.

Explanation of Plate 2:25:158

Fig. 1, ♂ RV, ext. lat. (I 1833, 810 µm long); fig. 2, ♀ LV, ext. lat. (IN 41918, 770 µm long); fig. 3, ♀ LV, ext. lat. (IO 6294, 770 µm long).

Scale A (250 µm ; ×74), fig. 1; scale B (250 µm ; ×78), figs. 2, 3.

*Lophocythere ostreata* (Jones and Sherborn, 1888)

1888 *Cytheridea ostreata* sp. nov. T. R. Jones & C. D. Sherborn, *Proc. Bath nat. Hist. antiq. Fld Club*, vol. 6, p. 271, pl. 4, figs. 6a-c.

1888 *Cytheridea bicarinata* sp. nov. T. R. Jones & C. D. Sherborn, *ibid.*, p. 270, pl. 4, figs. 5a-c.

1948 *Lophocythere ostreata* (Jones & Sherborn); P. C. Sylvester-Bradley, *Geol. Mag.*, vol. 85, no. 4, p. 195, pl. 14, figs. 1-4; pl. 15, figs. 1, 2.

1963 *Lophocythere ostreata* (Jones & Sherborn); H. J. Oertli, *Mesozoic ostracod faunas of France*, p. 42, pl. 28, fig. o; pl. 29, fig. o. Leiden.

1967 *Lophocythere ostreata* (Jones & Sherborn); R. H. Bate, *Bull. Br. Mus. nat. Hist. (Geol.)*, vol. 14, p. 51.

1969 *Lophocythere ostreata* (Jones & Sherborn); R. H. Bate, *ibid.*, vol. 17, no. 8, p. 420, pl. 12, fig. 5, text-fig. 13.

Holotype: Brit. Mus. (Nat. Hist.) I 1833, ♂ RV.

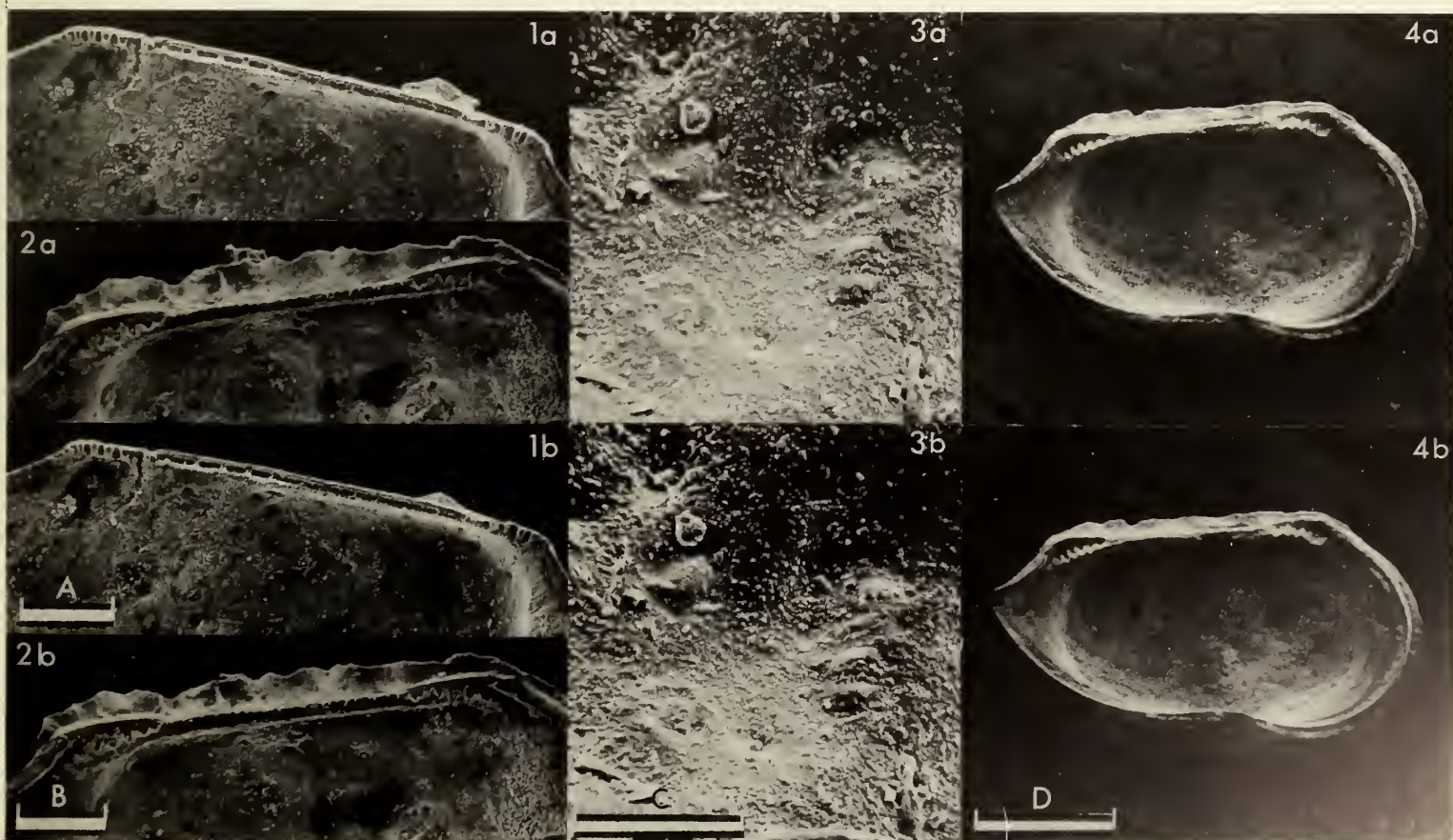
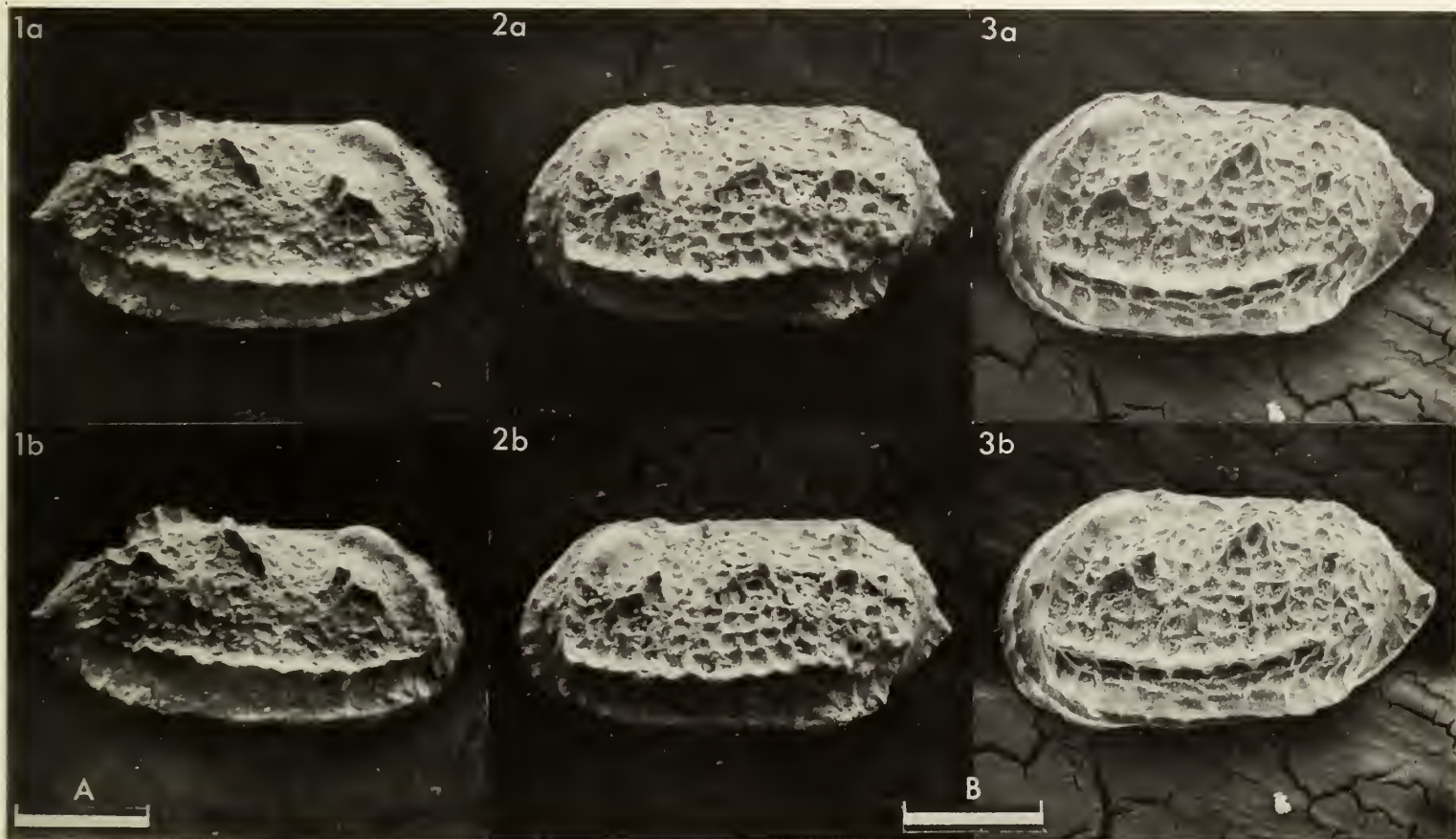
Type locality: Yellow Fuller's Earth Clay, Midford, Bath, Somerset, England.

**Diagnosis:** Species of subgenus *Lophocythere* having three major prominences obliquely aligned across each valve: most anterior being situated beneath the eye node, most dorsal situated just below and in front of the posterior cardinal angle. Shell surface reticulate, strength of reticulations variable. Ventral keel strongly developed.

Explanation of Plate 2:25:160

Fig. 1, ♂ RV, hinge, int. lat. (IN 41919, 730 µm long); fig. 2, ♀ LV, hinge, int. lat. (IO 6297, 710 µm long); fig. 3, ♂ RV, musc. sc. (IN 41919); fig. 4, ♀ LV, int. lat. (IO 6294).

Scale A (100 µm ; ×130), fig. 1; scale B (100 µm ; ×128), fig. 2; scale C (50 µm ; ×460), fig. 3; scale D (250 µm ; ×78), fig. 4.

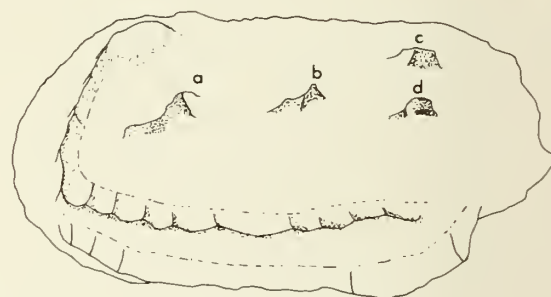






**Figured specimens:** Brit. Mus. (Nat. Hist.) nos. I 1833 (♂ RV: Pl. 2:25:158, fig. 1), IN 41918 (♀ LV: Pl. 2:25:158, fig. 2), IN 41919 (♂ RV: Pl. 2:25:160, figs. 1, 3; Pl. 2:25:164, fig. 1), IN 41920 (juv. LV: Pl. 2:25:164, fig. 2), IN 41921 (juv. RV: Pl. 2:25:164, fig. 3), IN 41922 (♀ car.: Pl. 2:25:162, figs. 1-3), IO 6294 (♀ LV: Pl. 2:25:158, fig. 3; Pl. 2:25:160, fig. 4), IO 6297 (♀ LV: Pl. 2:25:160, fig. 2). No. I 1833 from the type locality (Upper Bathonian); IO 6297, IN 41918-IN 41922 from the Boueti Bed (Upper Bathonian), Herbury, Dorset, England; IO 6294 from the Bathonian of Kirtlington Quarry, Oxfordshire, England.

**Remarks:** The position of the three major prominences (a-c; text-fig. 1) varies slightly between the left and right valves. A minor prominence (d) may be associated with these three, situated directly below the posterior-dorsal prominence (c) which is occasionally missing or reduced in size.



Text-fig. 1. Major ridge and prominences of *L. ostreata*.

#### Explanation of Plate 2:25:162

Fig. 1, ♀ car., vent. (IN 41922, 690 µm long); fig. 2, ♀ car., dors. (IN 41922); fig. 3, ♀ car., ant. (IN 41922).

Scale A (250 µm ; ×89), figs. 1, 2; scale B (250 µm ; ×114), fig. 3.

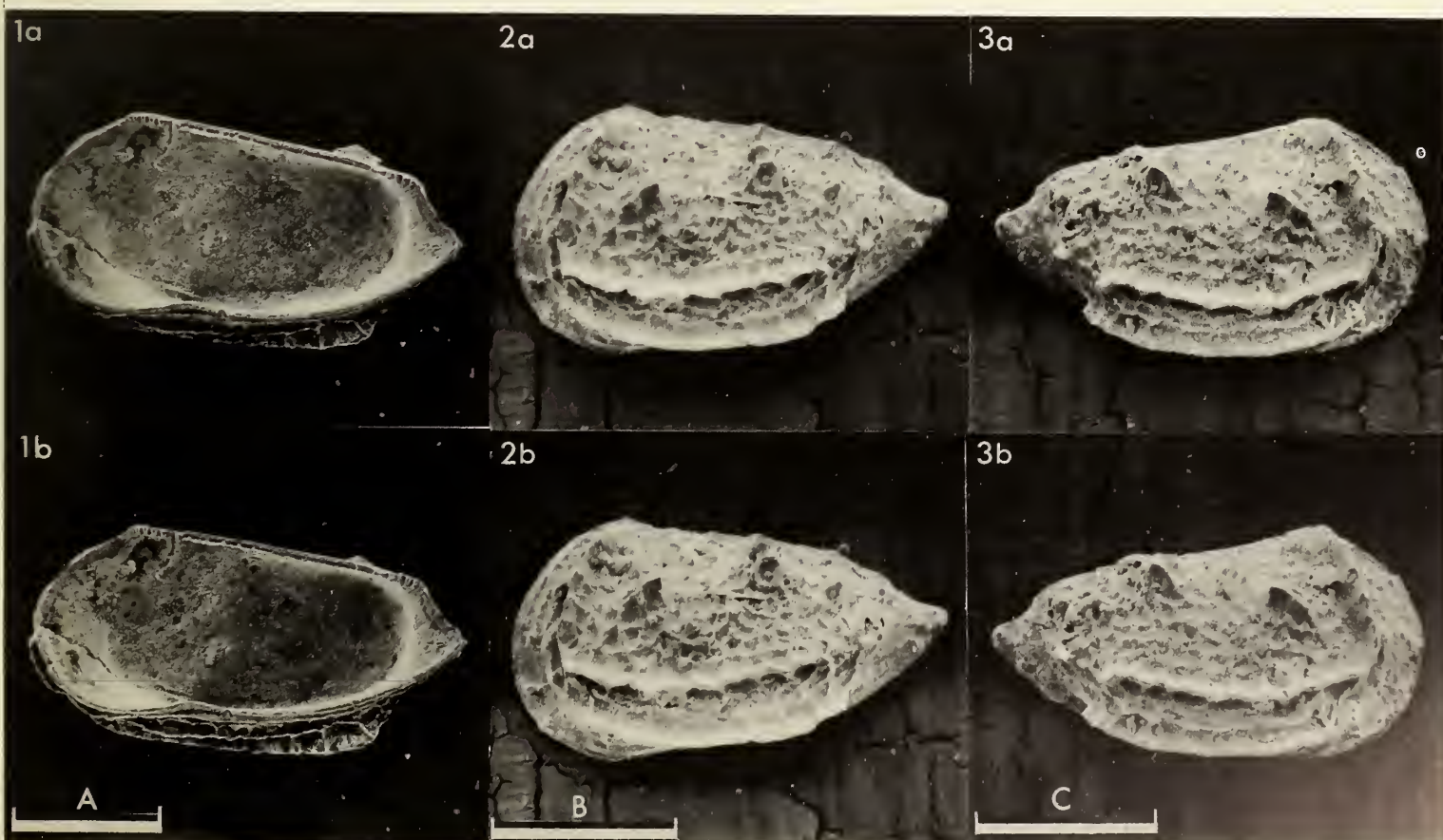
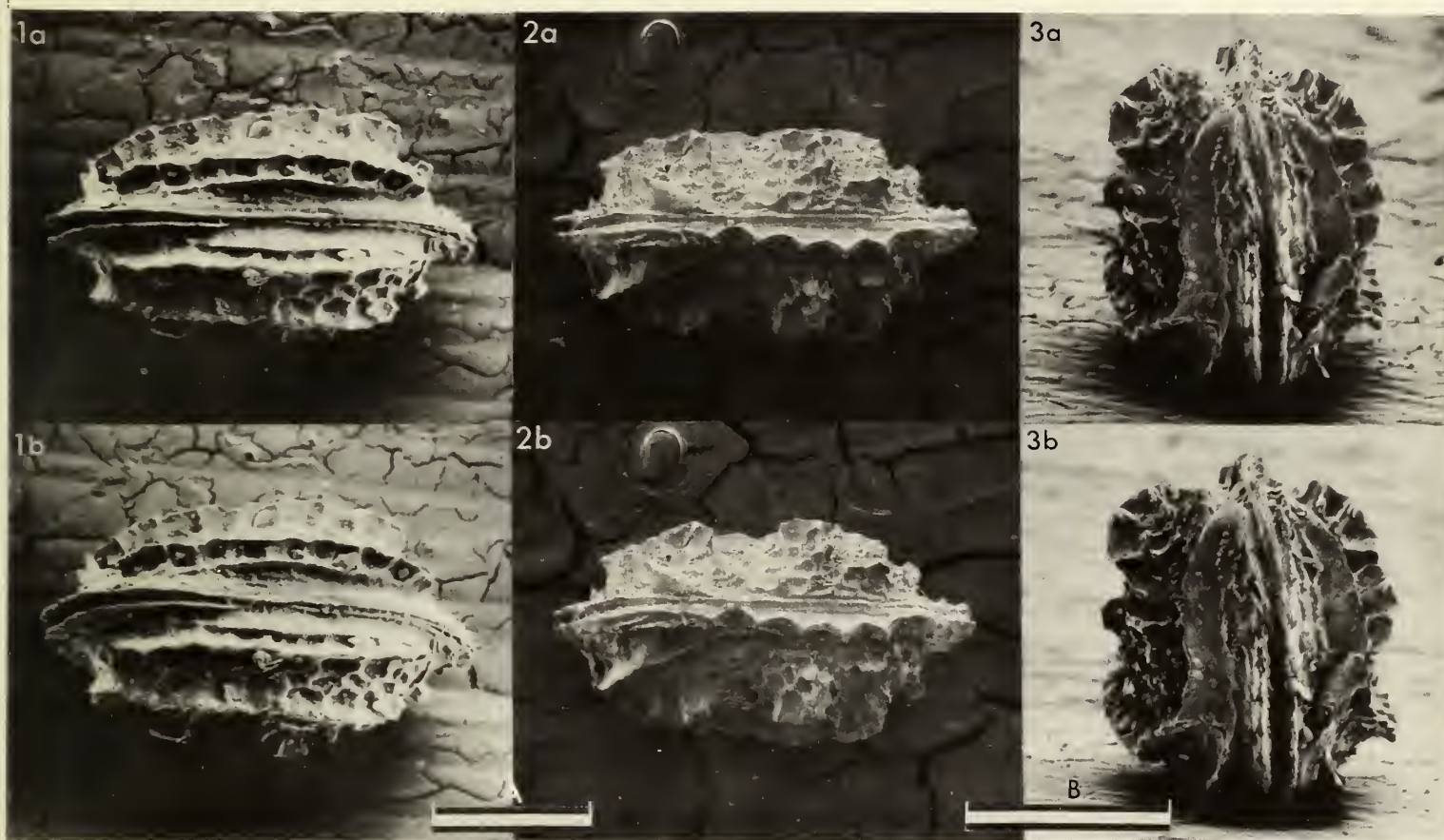
**Distribution:** A marine species. Found in the Middle to Upper Bathonian of the Vienne valley, E of Poitiers, France and Upper Bathonian of Boulogne-sur-Mer, France (Oertli, op. cit.); Upper Bathonian Yellow and Blue Fuller's Earth Clays of Bath, England (type locality; Jones & Sherborn, op. cit.); Upper Bathonian Boueti Bed, Herbury, near Langton Herring, Dorset, England (Nat. Grid Ref.: SY 610810; Sylvester-Bradley, op. cit.); Middle to Upper Bathonian of Kirtlington cement quarry, Kirtlington, near Oxford, England (Nat. Grid Ref.: SP 495200; herein); Middle Bathonian Upper Estuarine series, Kings Cliffe, Northamptonshire, England (Nat. Grid Ref.: TL 012966; Bate, 1967); base of Fuller's Earth Rock, at top of Fuller's Earth (Middle-Upper Bathonian) in Institute of Geological Sciences (I. G. S.) borehole no. 15 at Swainswick, Somerset, England (Nat. Grid Ref.: ST 75766907); Upper Fuller's Earth Clay, Upper Bathonian, in I. G. S. borehole no. 1 at Nettleton, Wiltshire, England (Nat. Grid Ref.: ST 82357846).

**Acknowledgement:** To I. G. S. and Messrs. Lander, Raikes and Marshall for access to the Swainswick borehole material, and to the Wessex Water Authority (and I. G. S.) for access to the Nettleton borehole material.

#### Explanation of Plate 2:25:164

Fig. 1, ♂ RV, int. lat. (IN 41919); fig. 2, juv. LV, ext. lat. (IN 41920, 590 µm long); fig. 3, juv. RV, ext. lat. (IN 41921, 550 µm long).

Scale A (250 µm ; ×82), fig. 1; scale B (250 µm ; ×101), fig. 2; scale C (250 µm ; ×110), fig. 3.







ON *LOPHOCY THERE* (*NEUROCY THERE*) *BRADIANA* (JONES)  
by Carol Mayes  
(*British Museum (Natural History)*, London)

Subgenus *NEUROCY THERE* Whatley, 1970

Type-species (by original designation): *Cythere bradiana* Jones, 1884

Diagnosis: Subgenus of *Lophocythere* with four or more longitudinal ribs converging towards anterior region of carapace. Minor ribs may be present. Intercostate region may be reticulate. Eye node distinct.

Explanation of Plate 2:26:166

Fig. 1, ♂ car., dors. (IN 42372, 620 µm long); fig. 2, ♀ RV, int. musc. sc. (SAC.670.C.5, 630 µm long); fig. 3, ♂ LV, hinge, int. lat. (SAC.670.C.6, 700 µm long); fig. 4, ♀ RV, hinge, int. lat. (SAC.670.C.7, 660 µm long).

Scale A (250 µm ; ×96), fig. 1; scale B (50 µm ; ×370), fig. 2; scale C (250 µm ; ×117), figs. 3, 4.

*Lophocythere* (*Neurocythere*) *bradiana* (Jones, 1884)

- 1884 *Cythere bradiana* sp. nov. T. R. Jones, *O. Jl geol. Soc. Lond.*, p. 772, pl. 34, fig. 38
- 1888 *Cytheridea craticula* sp. nov. T. R. Jones & C. D. Sherborn, *Proc. Bath nat. Hist. antiq. Fld Club*, vol. 6, p. 272, pl. 4, figs. 9a-c, 10a-c.
- 1948 *Lophocythere bradiana* (Jones); P. C. Sylvester-Bradley, *Geol. Mag.*, vol. 85, no. 4, p. 196, pl. 14, figs. 7-10; pl. 15, figs. 8-11.
- 1969 *Lophocythere bradiana* (Jones); R. H. Bate, *Bull. Br. Mus. nat. Hist. (Geol.)*, vol. 17, no. 8, p. 390, pl. 3, figs. 3, 5, 6, text-figs. 3, 4.
- 1969a *Lophocythere bradiana* (Jones); F. Dépêche, *Bull. Cent. Rech. Pau-SNPA*, vol. 3, p. 272, pl. 3, fig. 3.
- 1969b *Lophocythere bradiana* (Jones); F. Dépêche, *Revue Micropaléont.*, vol. 12, no. 2, pl. 3, fig. 8.
- 1970 *Lophocythere* (*Neurocythere*) *bradiana* (Jones); R. C. Whatley, *Bull. Br. Mus. nat. Hist. (Geol.)*, vol. 19, no. 6, p. 336.

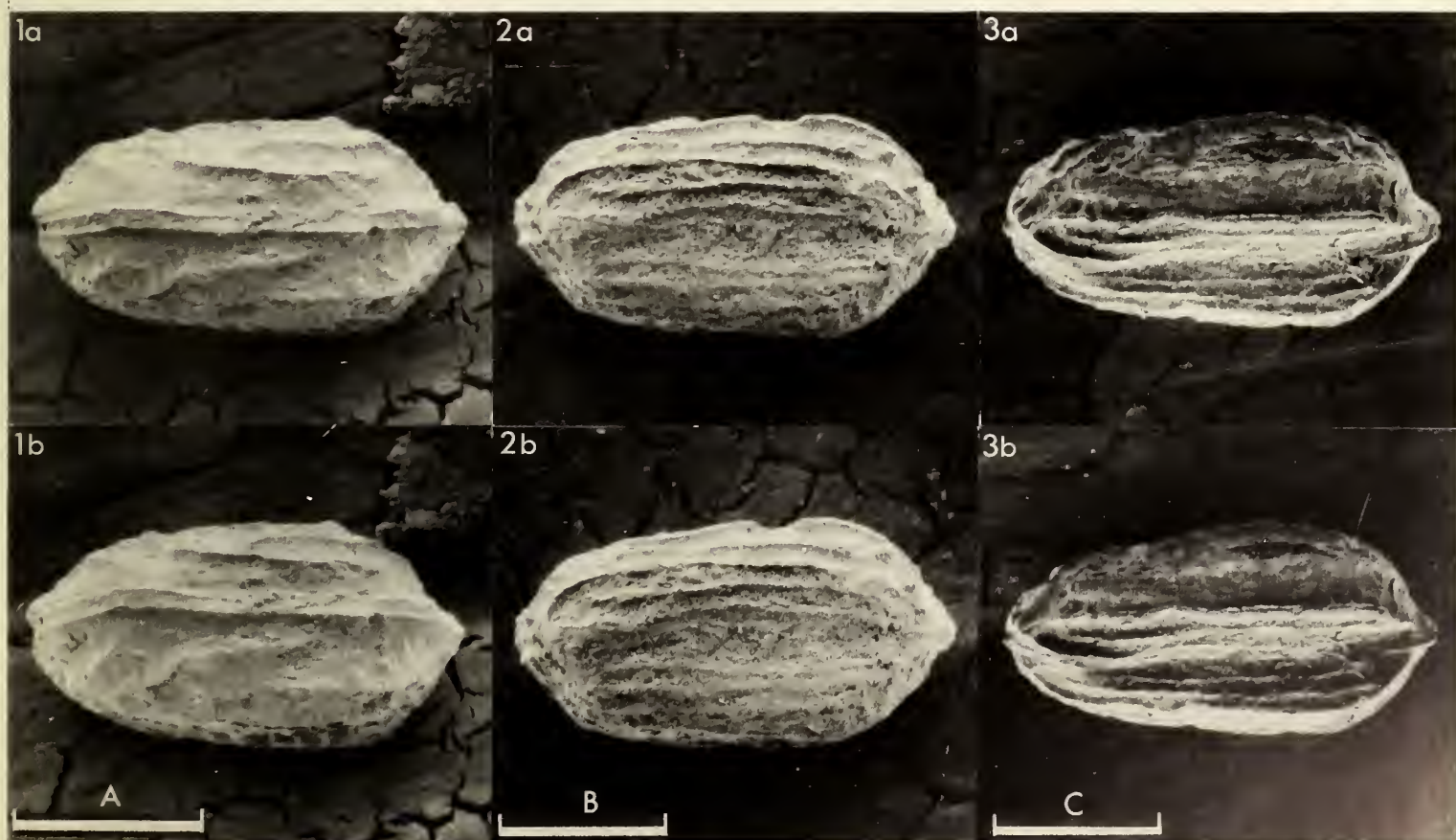
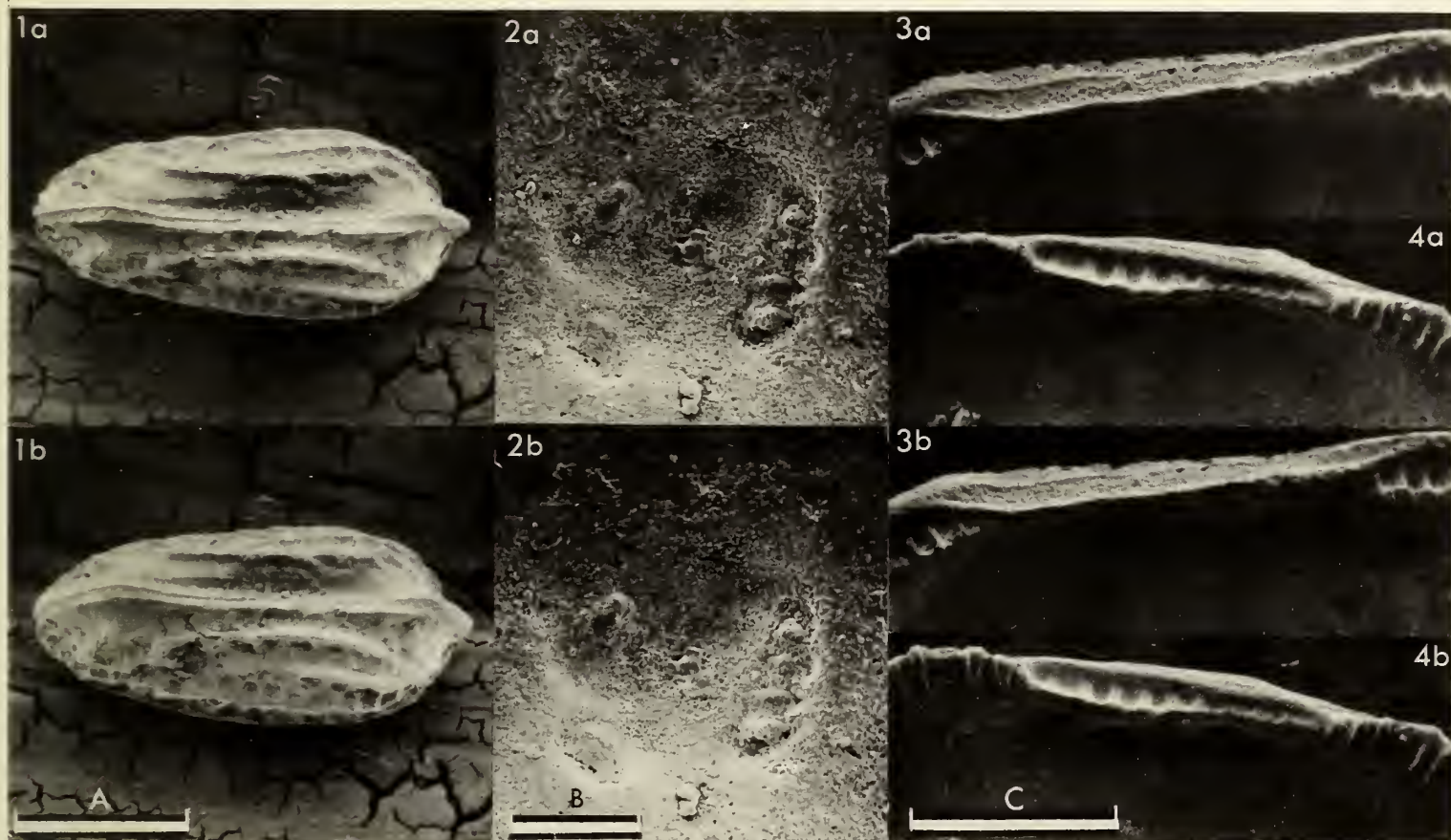
Lectotype: Brit. Mus. (Nat. Hist.) IN 42372, ♂ carapace.

Type locality: Richmond boring (at 1205 feet), Greater London, England; Great Oolite.  
Nat. Grid Ref.: approx. TQ 177747.

Explanation of Plate 2:26:168

Fig. 1, ♀ car., dors. (IO 3628, 570 µm long); fig. 2, ♀ car., vent. (IO 3629, 640 µm long); fig. 3, ♂ car., vent. (IO 3627, 630 µm long).

Scale A (250 µm ; ×105), fig. 1; scale B (250 µm ; ×93), fig. 2; scale C (250 µm ; ×95), fig. 3.







**Diagnosis:** Species of *Neurocythere* with four major carinae converging towards the anteroventral region and two minor carinae situated in the posterior half of the shell. Intervening shell surface reticulate.

**Figured specimens:** Brit. Mus. (Nat. Hist.) nos. IN 42372 (♂ car.: Pl. 2:26:166, fig. 1; Pl. 2:26:172, figs. 1, 3), IO 3627 (♂ car.: Pl. 2:26:168, fig. 3), IO 3628 (♀ car.: Pl. 2:26:168, fig. 1; Pl. 2:26:170, fig. 3), IO 3629 (♀ car.: Pl. 2:26:168, fig. 2). Institute of Geological Sciences (London) nos. SAC.670.C.1 (♂ LV: Pl. 2:26:172, fig. 2), SAC.670.C.3 (♀ car.: Pl. 2:26:170, fig. 2), SAC.670.C.4 (♀ car.: Pl. 2:26:170, fig. 1), SAC.670.C.5 (♀ RV: Pl. 2:26:166, fig. 2), SAC.670.C.6 (♂ LV: Pl. 2:26:166, fig. 3), SAC.670.C.7 (♀ RV: Pl. 2:26:166, fig. 4). Nos. IN 42372, IO 3627-IO 3629 are all from the type locality. SAC.670.C.1, SAC.670.C.3-SAC.670.C.7 are all from the Upper Fuller's Earth Clay, Upper Bathonian (at depth 20.38 m - 20.85 m) in the Institute of Geological Sciences (I. G. S.) borehole no. 1 at Nettleton in Wiltshire, England; Nat. Grid Ref.: ST 82357846.

**Remarks:** Variations occur with the minor carinae and the reticulations between them (see Pl. 2:26:170, fig. 1; Pl. 2:26:172, fig. 1).

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#### Explanation of Plate 2:26:170

Fig. 1, ♀ car., ext. rt. lat. (SAC.670.C.4, 610 µm long); fig. 2, ♀ car., ext. lt. lat. (SAC.670.C.3, 610 µm long); fig. 3, ♀ car., ant. (IO 3628).

Scale A (250 µm ; ×98), figs. 1, 2; scale B (100 µm ; ×125), fig. 3.

**Distribution:** A marine species. Found in the Bathonian of Lorraine, France (Dépêche, 1969b) and the Callovian of Chonville no. 1 well, Lorraine, France (Dépêche, 1969a); the Upper Bathonian, Yellow and Blue Fuller's Earth Clays of Midford, near Bath, Somerset, England (Jones & Sherborn, op. cit.); Great Oolite, Richmond, England (type locality; Jones, op. cit.); Boueti Bed, Great Oolite, Herbury, Dorset, England (Sylvester-Bradley, op. cit.); Upper Fuller's Earth Clay, Upper Bathonian, I. G. S. borehole Nettleton, Wiltshire, England (herein).

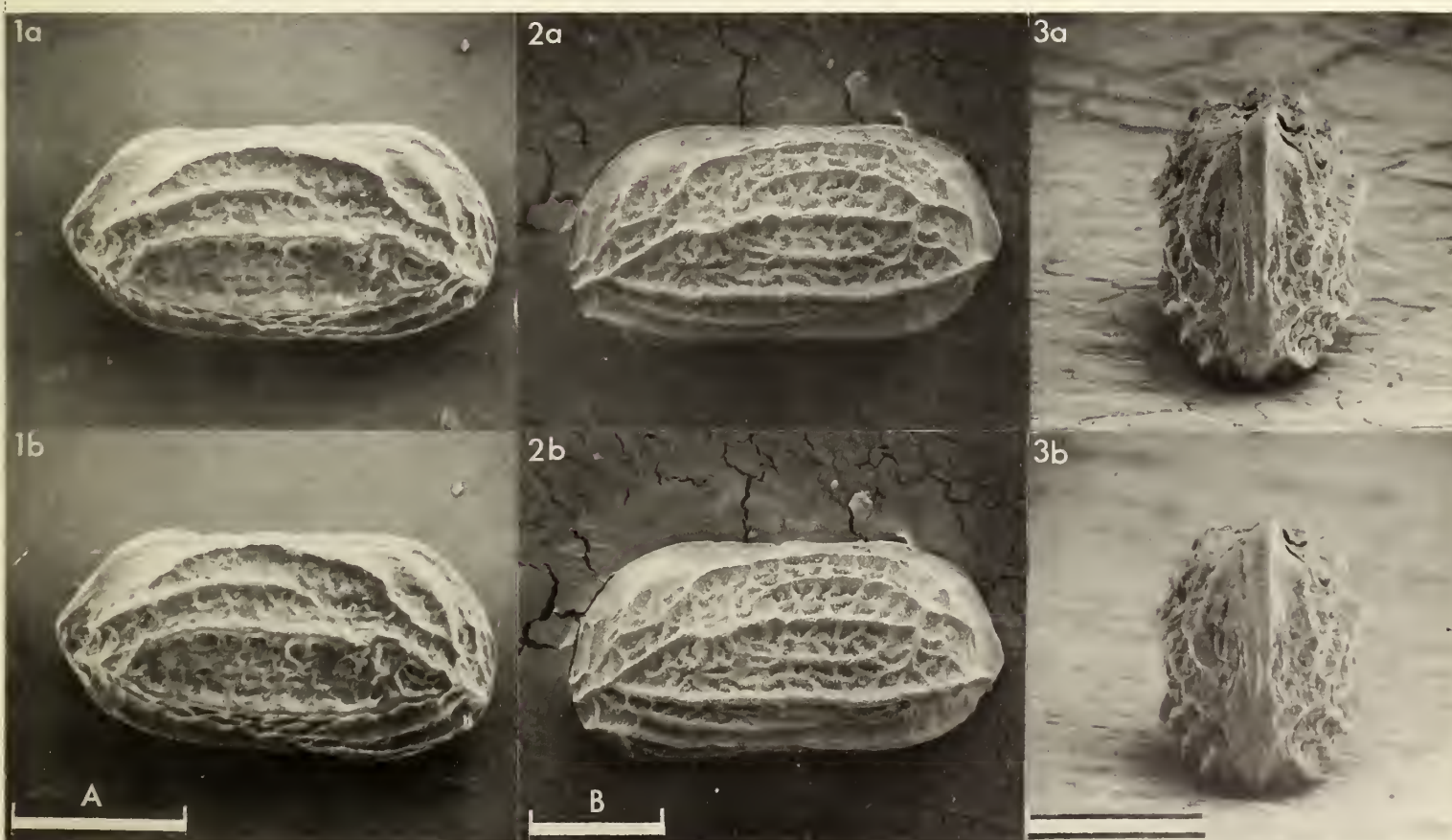
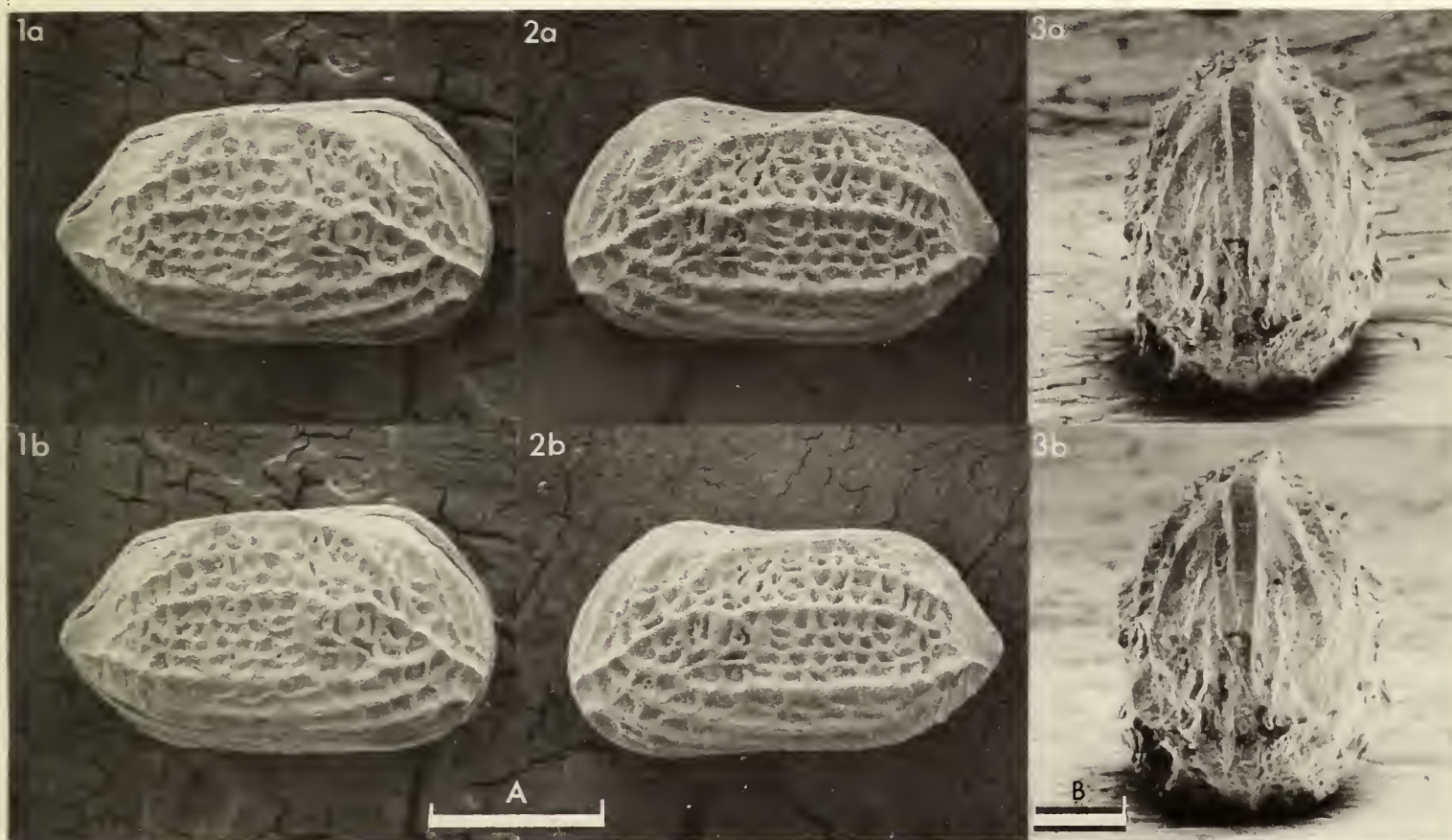
**Acknowledgement:** To I. G. S. and the Wessex Water Authority for access to the Nettleton borehole material.

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#### Explanation of Plate 2:26:172

Fig. 1, ♂ car., ext. rt. lat. (IN 42372); fig. 2, ♂ LV, ext. lat. (SAC.670.C.1, 810 µm long); fig. 3, ♂ car., ant. (IN 42372).

Scale A (250 µm ; ×96), fig. 1; scale B (250 µm ; ×75), fig. 2; scale C (250 µm ; ×100), fig. 3.







ON *PROGONOCYTHERE STILLA* SYLVESTER-BRADLEY  
by Carol Mayes  
(British Museum (Natural History), London)

Genus *PROGONOCYTHERE* Sylvester-Bradley, 1948

Type-species (by original designation): *Progonocythere stilla* Sylvester-Bradley, 1948

**Diagnosis:** Progonocytherinae with dimorphic carapace tapering to posterior end. Shell surface smooth or weakly ornamented. Lateral border overhanging ventral surface. Left valve larger than right. Hinge entomodont. Duplicature of moderate width with few, straight marginal pore canals. Four adductor muscle scars and a single oval or rounded frontal scar.

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Explanation of Plate 2:27:174

Fig. 1, ♂ RV, ext. lat. (IN 41908, 670 µm long); fig. 2, ♀ RV, ext. lat. (IO 6288, 610 µm long).

Scale A (250 µm ; ×125), fig. 1; scale B (250 µm ; ×125), fig. 2.

*Progonocythere stilla* Sylvester-Bradley, 1948

- 1948 *Progonocythere stilla* sp. nov. P. C. Sylvester-Bradley, *Geol. Mag.*, vol. 85, no. 4, p. 190, pl. 12, figs. 1, 2; pl. 13, figs. 1, 2.
- 1956 *Progonocythere stilla* Sylvester-Bradley; N. Grekoff, *Guide pratique pour la détermination des ostracodes post-Paléozoïques*, pl. 13, figs. 325-7, Soc. éd. Tecnip.
- 1963 *Progonocythere stilla* Sylvester-Bradley; H. J. Oertli, *Mesozoic ostracod faunas of France*, p. 44, pl. 28, fig. n; pl. 29, fig. n. Leiden.
- 1969 *Progonocythere stilla* Sylvester-Bradley; R. H. Bate, *Bull. Br. Mus. nat. Hist. (Geol.)*, vol. 17, no. 8, p. 423, pl. 13, fig. 2.

Holotype: Brit. Mus. (Nat. Hist.) IN 41908, ♂ RV.

Type locality: Boueti Bed, Upper Bathonian; Herbury, Dorset, England. Nat. Grid Ref.: SY 610810.

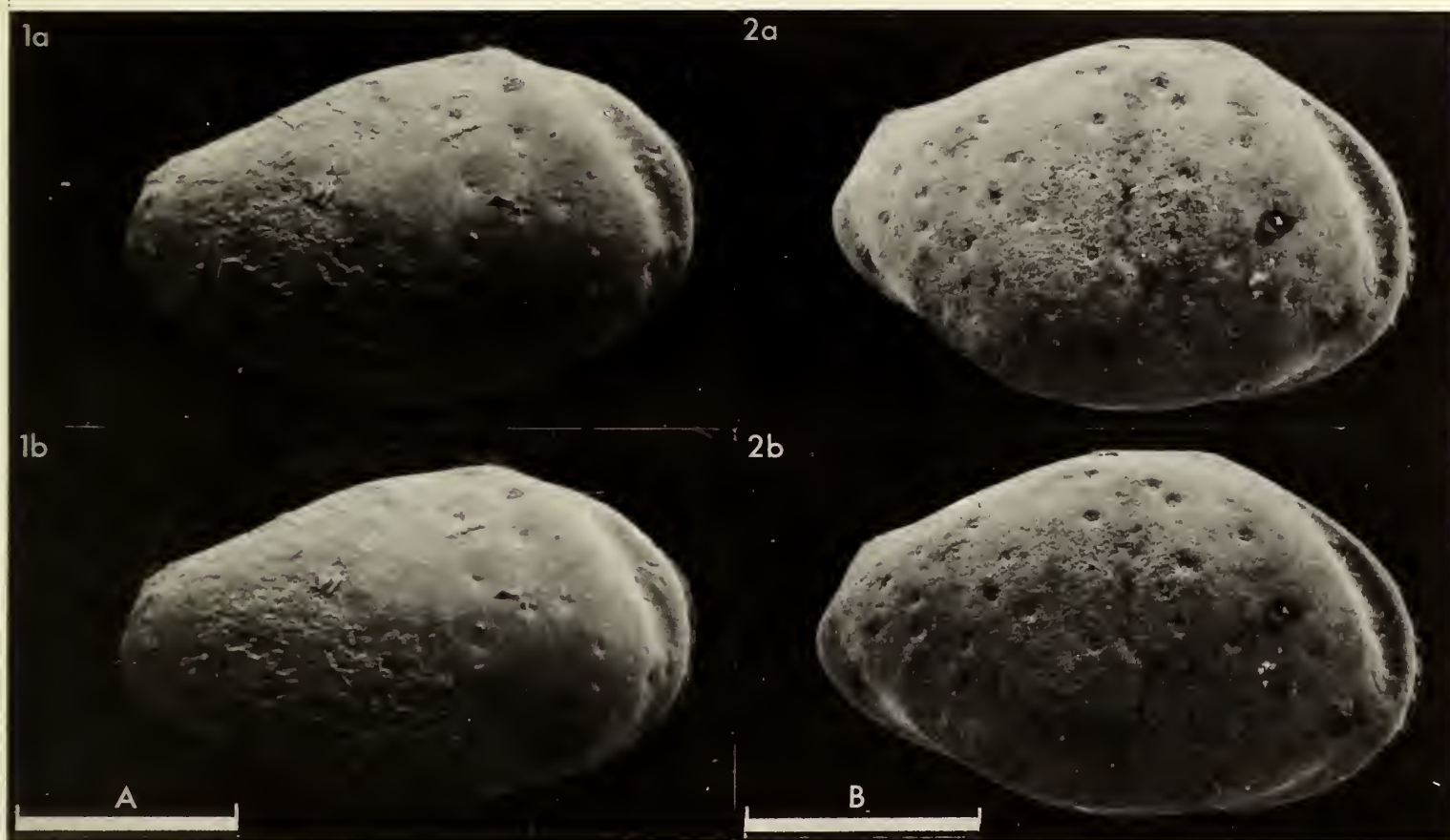
**Diagnosis:** Species of *Progonocythere* with finely punctate shell; irregularly placed, large, circular normal pores, concentrated towards centre of valve. Outline of shell is tear-drop shaped.

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Explanation of Plate 2:27:176

Fig. 1, ♂ LV, hinge, dors. (IN 41909, 660 µm long); fig. 2, ♂ LV, hinge, int. lat. (IN 41909); fig. 3, ♂ LV, int. lat. (IN 41909).

Scale A (100 µm ; ×210), fig. 1; scale B (100 µm ; ×160), fig. 2; scale C (100 µm ; ×120), fig. 3.







**Figured specimens:** Brit. Mus. (Nat. Hist.) nos. IN 41908 (♂ RV: Pl. 2:27:174, fig. 1), IN 41909 (♂ LV: Pl. 2:27:176, figs. 1-3), IO 6287 (♂ LV: Pl. 2:27:180, fig. 3), IO 6288 (♀ RV: Pl. 2:27:174, fig. 2), IO 6289 (♂ car.: Pl. 2:27:180, fig. 1), IO 6290 (♀ car.: Pl. 2:27:178, figs. 1, 3), IO 6291 (♀ car.: Pl. 2:27:178, fig. 2), IO 6292 (♂ car.: Pl. 2:27:180, fig. 2). IN 41908, IN 41909 and IO 6287 are from the Upper Bathonian of the type locality. IO 6288-IO 6292 are from the "Bastard Earth", approximately 1.5 m above top of commercial Fuller's Earth, Upper Fuller's Earth Clay (Upper Bathonian), in a small quarry in Vernham Wood, Odd Down, 3 km S of Bath, Somerset, England (Nat. Grid Ref.: ST 733618); coll. P. C. Sylvester-Bradley 1947 (Field ref.: 47 VW7). Carapace IO 6291 has been lost after preparation and photography.

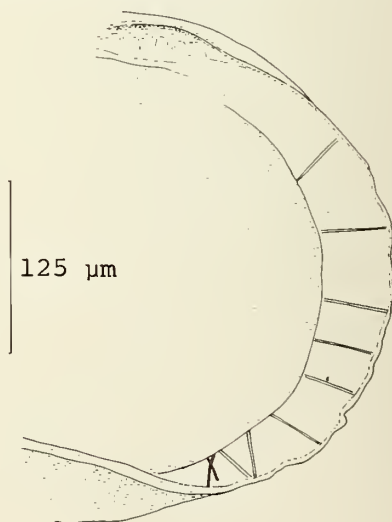
**Remarks:** In some specimens a slightly sinuous vertical sulcus is situated in the middle of each valve (Pl. 2:27:174, fig. 2). This sulcus, very weakly developed, has occasionally been seen in topotype material but generally it is lacking. The species derives its name from the characteristic tear-drop shape of the shell.

#### Explanation of Plate 2:27:178

Fig. 1, ♀ car., dors. (IO 6290, 600 µm long); fig. 2, ♀ car., vent. (IO 6291, 620 µm long); fig. 3, ♀ car., ant. (IO 6290).

Scale A (250 µm ; ×100), fig. 1; scale B (250 µm ; ×96), fig. 2; scale C (250 µm ; ×114), fig. 3.

**Distribution:** A marine species. Found in the Middle to Upper Bathonian of the Vienne valley, E of Poitiers, and the Upper Bathonian of Boulogne-sur-Mer, France (Oertli, op. cit.); Upper Bathonian Boueti Bed, Herbury, near Langton Herring, Dorset, England (type locality; Sylvester-Bradley, op. cit.); Upper Bathonian Upper Fuller's Earth Clay near Bath, Somerset, England (herein); Upper Bathonian Blue Fuller's Earth Clay, Midford, near Bath, Somerset (Bate, op. cit.).

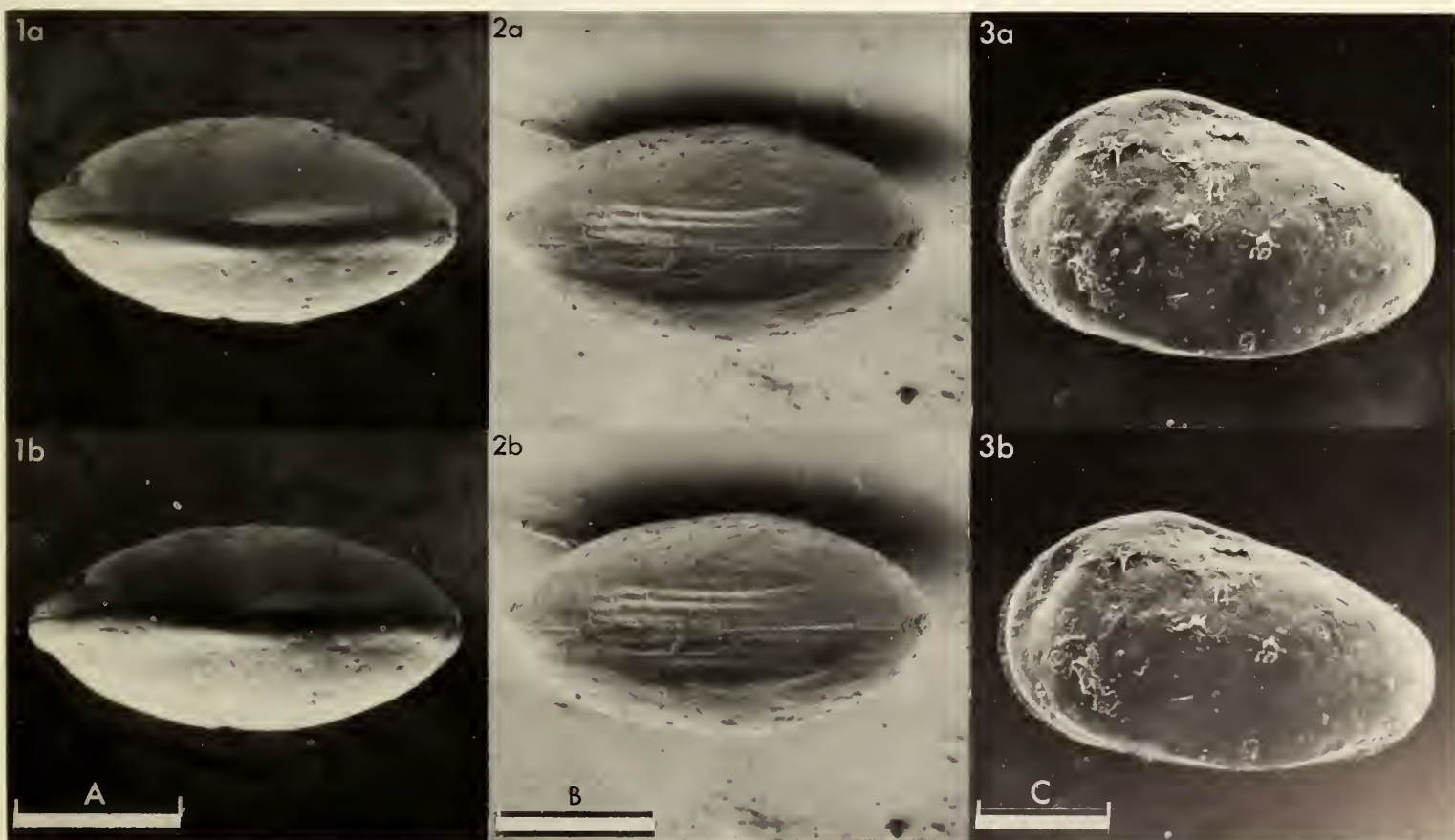
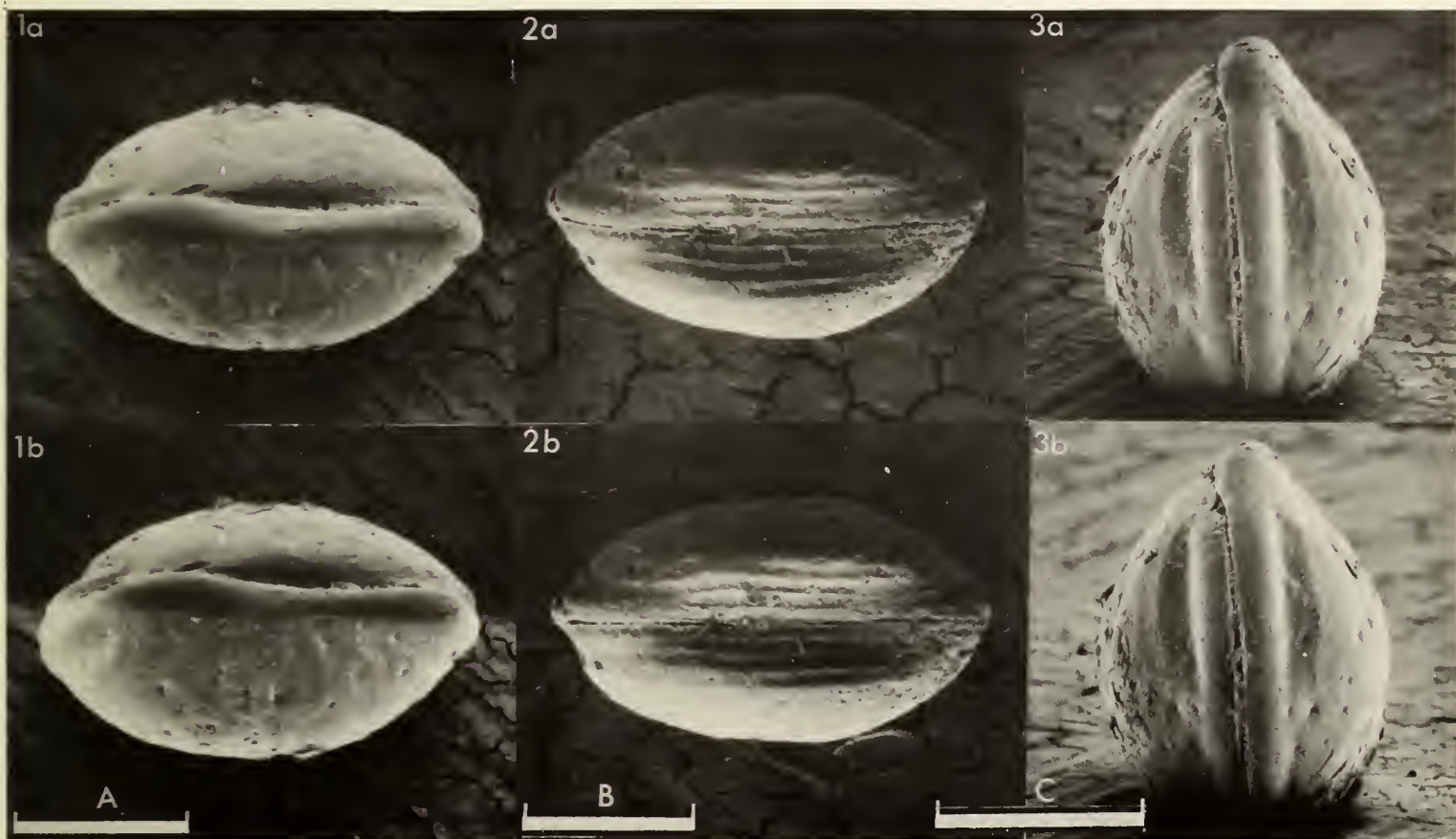


Text-fig. 1. Marginal pore canals in *P. stilla* (IO 6293).

#### Explanation of Plate 2:27:180

Fig. 1, ♂ car., dors. (IO 6289, 650 µm long); fig. 2, ♂ car., vent. (IO 6292, 660 µm long); fig. 3, ♂ LV, ext. lat. (IO 6287, 770 µm long).

Scale A (250 µm ; ×92), fig. 1; scale B (250 µm ; ×90), fig. 2; scale C (250 µm ; ×78), fig. 3.







ON *ARGENTICYTHERETTA* (*ARGENTICYTHERETTA*) *PATAGONIENSIS* ROSE sp. nov.

by John F. Rose

(University of Hull, England)

*Argenticytheretta* (*Argenticytheretta*) *patagoniensis* sp. nov.

Holotype: University of Hull coll. no. HU.220.T.12, ♂ RV.

Type locality: Pozo El Salto no. 1 between 1200-1203 m depth, N of Seno Skyring (Skyring Sound), Magallanes Province, Chile; approx. long. 71°43'W, lat. 52°31'S. Fine glauconitic shale with abundant microfauna suggesting cool shelf seas; Oligocene (Rosarian).

Derivation of name: From Patagonia, Chile.

Figured specimens: University of Hull coll. nos. HU.220.T.14.1 (♀ LV: Pl. 2:28:182, fig. 1; Pl. 2:28:184, fig. 3), HU.220.T.14.2 (♀ RV: Pl. 2:28:182, fig. 2), HU.220.T.14.3 (♀ RV: Pl. 2:28:184, fig. 1), HU.220.T.14.4 (♂ RV: Pl. 2:28:184, figs. 2, 4), HU.220.T.13.1 (♀ RV: Pl. 2:28:186, fig. 1), HU.220.T.12 (♂ RV: Pl. 2:28:188, fig. 1), HU.220.T.13.2 (♂ RV: Pl. 2:28:188, fig. 2), HU.220.T.13.3 (♂ RV: Pl. 2:28:188, fig. 3), HU.220.T.15.1 (♀ LV: Pl. 2:28:186, fig. 2), HU.220.T.15.2 (♀ RV: Pl. 2:28:186, fig. 3).

## Explanation of Plate 2:28:182

Fig. 1, ♀ LV (morphotype B), ext. lat. (HU.220.T.14.1, 870 µm long); fig. 2, ♀ RV (morphotype B), ext. lat. (HU.220.T.14.2, 940 µm long).

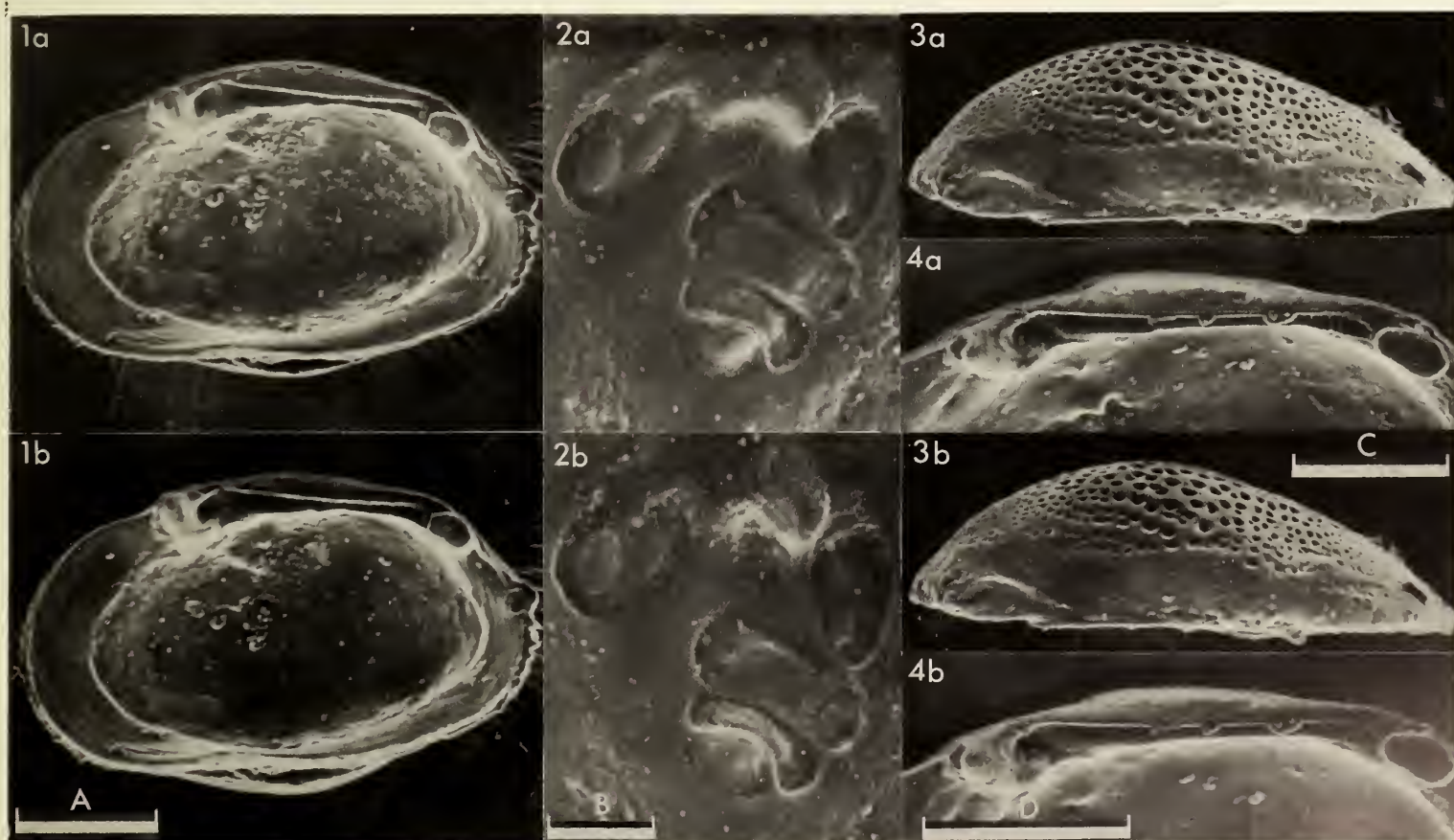
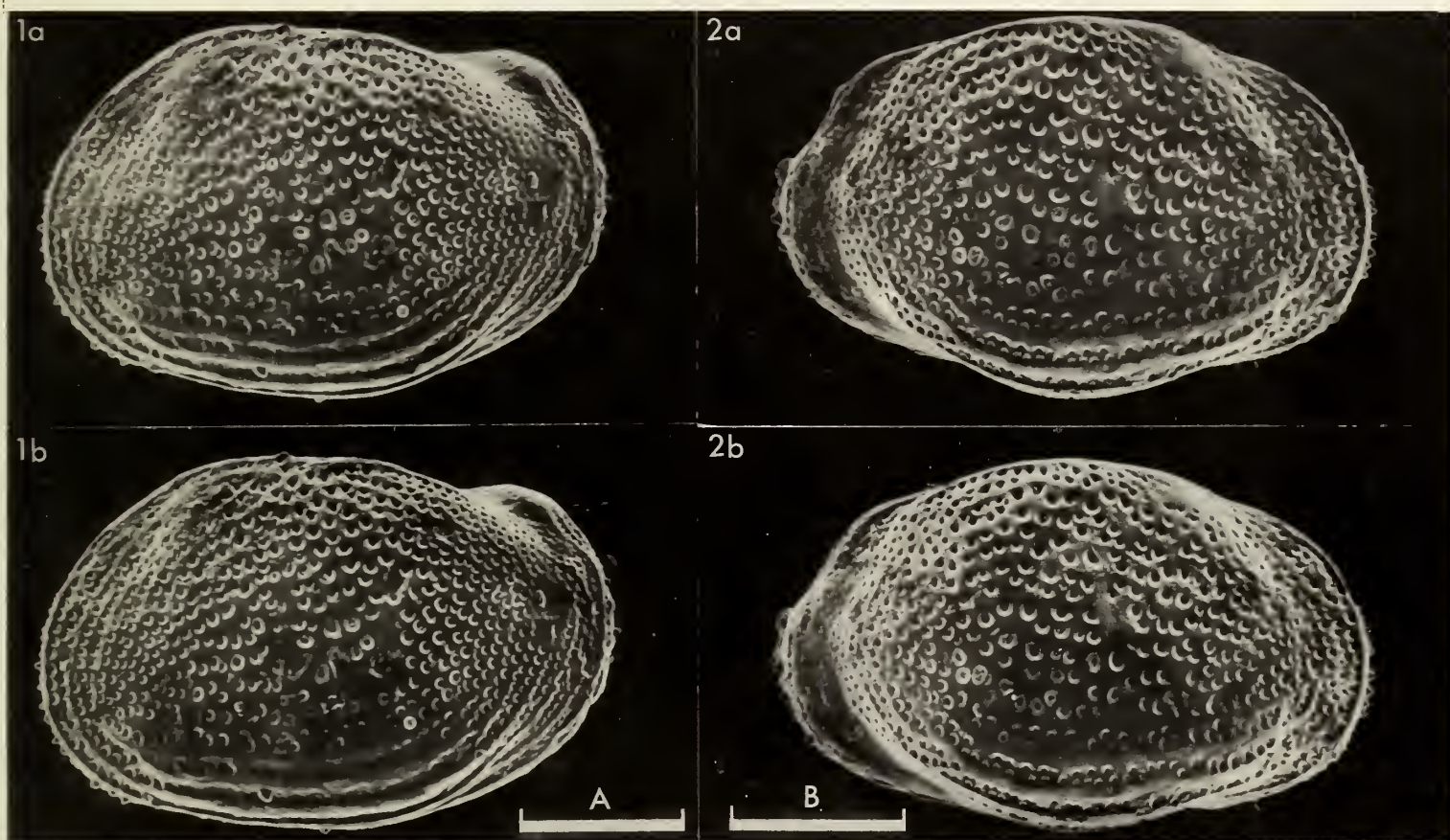
Scale A (250 µm ; ×91), fig. 1; scale B (250 µm ; ×94), fig. 2.

Figured specimens: The specimens were obtained from several wells drilled in a small area in the N of Peninsula Brunswick and around the eastern end of Seno Skyring, Magallanes Province, Chile. HU.220.T.14.1 from Pozo San Antonio no. 1 (approx. long. 71°31'W, lat. 52°19'S), between 2935-2938 m; Middle Eocene (Brunswickian). HU.220.T.14.2 from Pozo Tranquilo no. 1 (approx. long. 72°08'W, lat. 51°57'S), between 1454-1457 m; Lower Eocene (Manzanian). HU.220.T.15.1 from Pozo Laguna Blanca no. 1 (approx. long. 71°07'W, lat. 52°16'S), between 1614-1616 m; Upper Oligocene (Miradorian). HU.220.T.13.2 from Pozo Mina Rica no. 1 (approx. long. 71°08'W, 52°02'S), between 65-71 m; Upper Eocene (Clarencian). HU.220.T.12 from type locality and horizon. Specimens HU.220.T.14.3, HU.220.T.14.4, HU.220.T.13.1, HU.220.T.15.2 and HU.220.T.13.3 from Pozo El Salto no. 1 (see type locality), Oligocene (Cameronian); HU.220.T.14.3 from between 1431-1434 m, HU.220.T.13.3 from between 1461-1464 m, HU.220.T.13.1 from between 1595-1596 m, HU.220.T.14.4 and HU.220.T.15.2 both from 1623-1626 m.

## Explanation of Plate 2:28:184

Fig. 1, ♀ RV (morphotype A), int. lat. (HU.220.T.14.3, 900 µm long); fig. 2, ♀ RV (morphotype A), int. musc. sc. (HU.220.T.14.4); fig. 3, ♀ LV (morphotype B), ext. dors. (HU.220.T.14.1); fig. 4, ♀ RV (morphotype A), int. hinge (HU.220.T.14.4, 950 µm long).

Scale A (250 µm ; ×80), fig. 1; scale B (40 µm ; ×385), fig. 2; scale C (250 µm ; ×87), fig. 3; scale D (250 µm ; ×120), fig. 4.







**Diagnosis:** Ornament very variable. Pits usually arranged in double rows each of which may be separated by ribs of varying strength. Pitting becomes coarser towards the central part of the valve where pits often coalesce, especially in the more heavily ornamented forms. Marginal pore canals numerous and slightly curved; a small vestibule may be developed. The species has been subdivided into four morphotypes:-

Morphotype A: The most common variant, this shows fairly coarse pitting and strong ribbing over most of the valve (see Pl. 2:28:188, fig. 1).

Morphotype B: Pitting fairly coarse, but ribs not well developed except in the ventral portion of the valves (see Pl. 2:28:182, figs. 1, 2).

Morphotype C: Pitting quite fine but ribs strongly developed (see Pl. 2:28:188, fig. 2).

Morphotype D: Ribs very strong and may fuse. Pits tend to be rather irregular in size and shape (see Pl. 2:28:188, fig. 3).

Sexual dimorphism similar in all morphotypes; males are longer and thinner.

#### Explanation of Plate 2:28:186

Fig. 1, ♀ RV (morphotype B), ext. lat. (HU.220.T.13.1, 780 µm long); fig. 2, ♀ LV (morphotype A), post. snap-knob (HU.220.T.15.1, 900 µm long); fig. 3, ♀ RV (damaged by gastropod predation; morphotype uncertain), post. snap-knob (HU.220.T.15.2, 900 µm long).

Scale A (250 µm ; ×78), fig. 1; scale B (50 µm ; ×250), fig. 2; scale C (50 µm ; ×250), fig. 3.

**Remarks:** There are no obvious environmental factors that might explain the apparently random changes that occur throughout the range of the species (Palaeocene to Oligocene; see text-fig. 2). They cannot be linked to substrate type, age or geographic location in any way. It seems that like many other members of the Cytherettinae, this is a highly variable species.

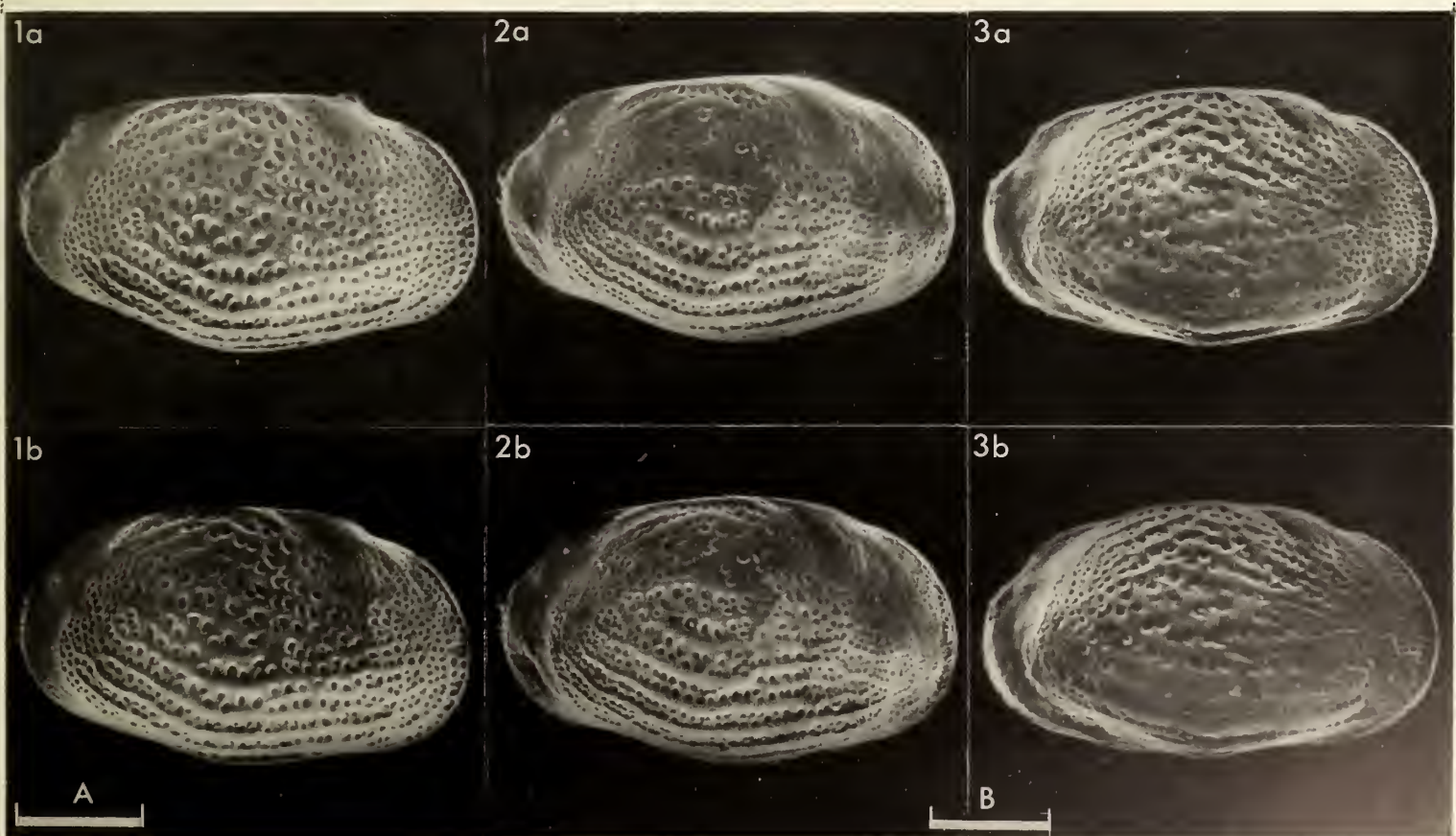
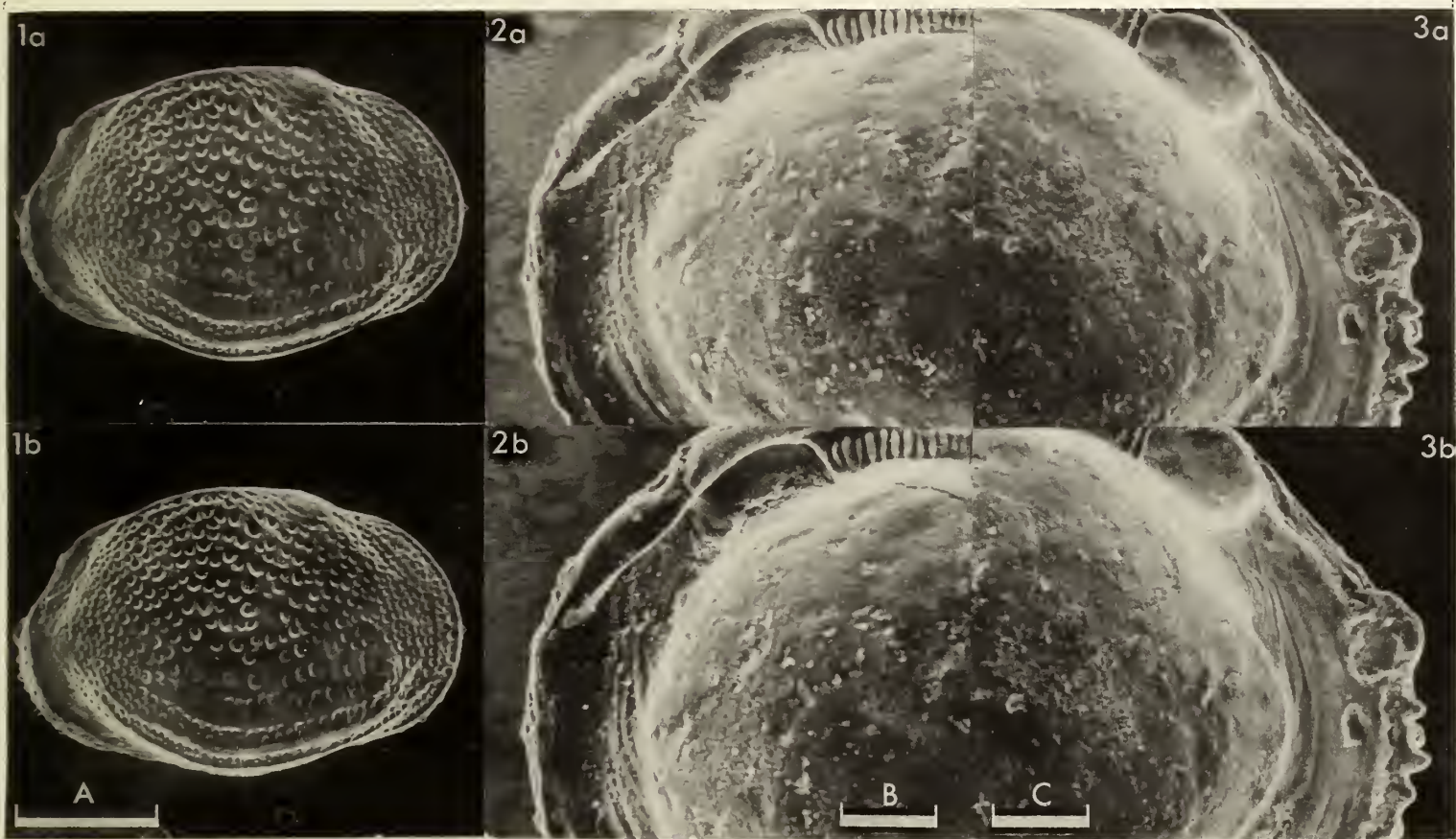
This species is placed in *Argenticytheretta* Rossi de Garcia, 1969, although *A. patagoniensis* has an ocular structure, a feature not mentioned in the original generic description. However, from Rossi de Garcia's drawings it appears that an eye is probably present in the type species *A. miocenica*. The regular inner margin, and overall shape of the valves in the present species agree well with *Argenticytheretta*.

*A. patagoniensis* exhibits an unusual feature in that it has a posterior "snap-knob." A marked socket is present in the right valve, and a weakly developed knob in the form of an angular projection at the point of maximum length is seen in the left valve. This feature is seen in several other species of *Argenticytheretta* including *A. riescoensis* sp. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 195-198, 1975), and *A. gonzalezi* (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 191-194, 1975).

#### Explanation of Plate 2:28:188

Fig. 1, ♂ RV (morphotype A), ext. lat. (HU.220.T.12, 980 µm long); fig. 2, ♂ RV (morphotype C), ext. lat. (HU.220.T.13.2, 950 µm long); fig. 3, ♂ RV (morphotype D), ext. lat. (HU.220.T.13.3, 950 µm long).

Scale A (250 µm ; ×64), fig. 1; scale B (250 µm ; ×65), figs. 2, 3.



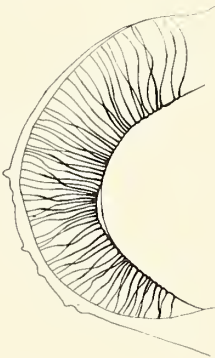


Remarks (contd.): South America is the home of a group of cytherettid taxa including *Argenticytheretta* (*Argenticytheretta*), *Argenticytheretta* (*Magallanella*) subgen. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 203-206, 1975) and *Argenticytheretta* (*Chilea*) subgen. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 207-210, 1975) which are distinctive in possessing a regular inner margin and an ocular structure. Undescribed buntoniids from southern Chile also exhibit these features.

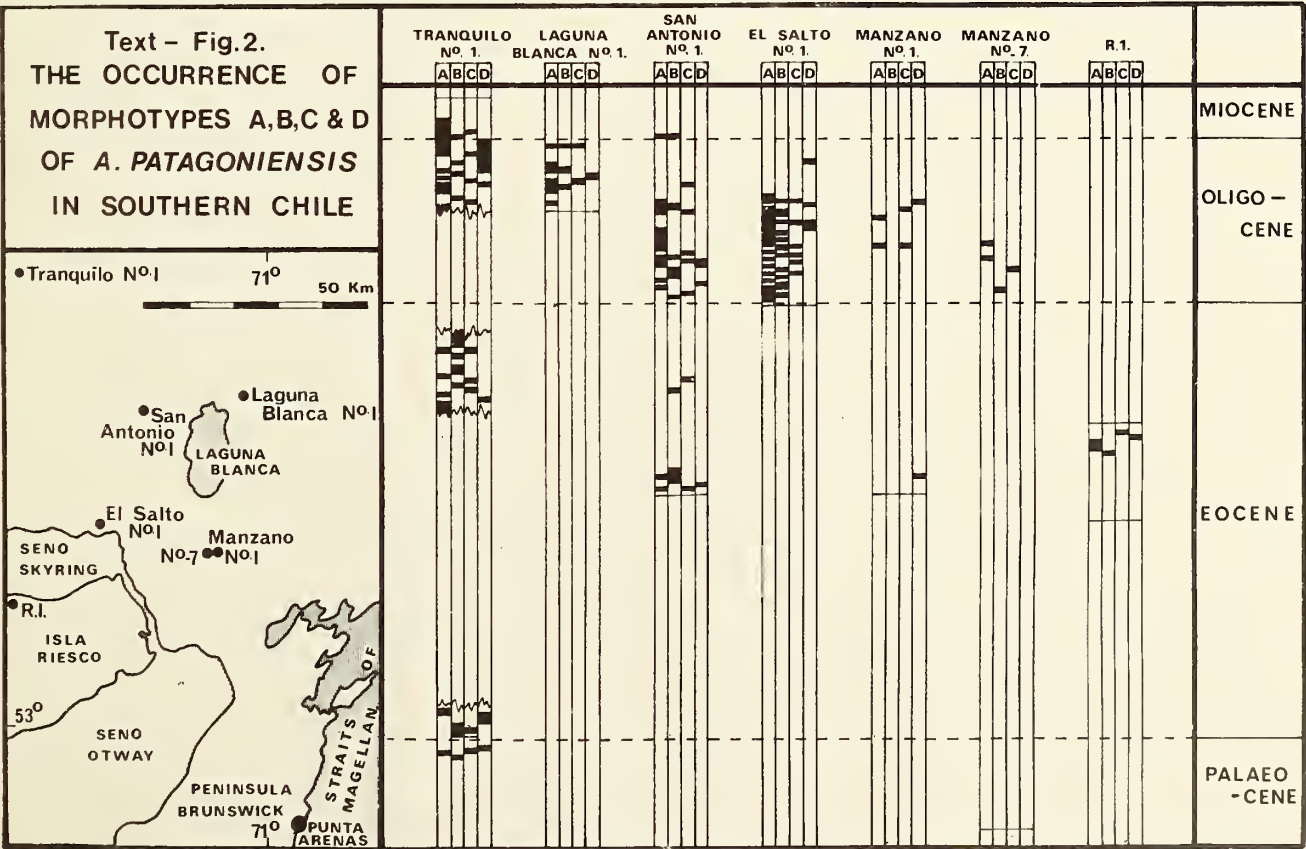
*Cytheretta knysnaensis* Benson, 1964 also has a similar inner margin, and the author implies the presence of an eye. This suggests that cytherettid forms of this type are perhaps more widespread in the Southern Hemisphere.

Distribution: The species is not widespread and is found only in northern Peninsula Brunswick, eastern Isla Riesco and just N and E of Seno Skyring, Chile.

*A. patagoniensis* makes up about 10% of the ostracod fauna throughout the Eocene, but in the Oligocene becomes very common and may make up to 40% of individual ostracod populations.



Text-fig. 1. Marginal pore canals (HU.220.T.14.3).







ON *ARGENTICYTHERETTA* (*ARGENTICYTHERETTA*) *GONZALEZI* ROSE sp. nov.  
by John F. Rose  
(University of Hull, England)

*Argenticytheretta* (*Argenticytheretta*) *gonzalezi* sp. nov.

Holotype: University of Hull coll. no. HU.220.T.5, ♀ LV.

Type locality: Pozo Ponsonby no. 7E between 222-227 m depth, near the eastern limit of Isla Riesco, Magallanes Province, Chile; approx. long. 71°49'W, lat. 52°40'S. Grey shale of Lower Oligocene age (Cameronian) with an abundant fauna including ostracods, foraminifera and molluscs suggesting shelf conditions.

Derivation of name: In honour of Sr. Eduardo Gonzalez, of Empresa Nacional del Petroleo, Magallanes, in gratitude for his great help during my visit to Chile.

Figured specimens: University of Hull coll. nos. HU.220.T.6.1 (♂ RV: Pl. 2:29:192, fig. 1), HU.220.T.5 (♀ LV: Pl. 2:29:192, fig. 2), HU.220.T.6.2 (♂ RV: Pl. 2:29:194, fig. 1), HU.220.T.6.3 (♂ LV: Pl. 2:29:194, fig. 2), HU.220.T.6.4 (♀ car.: Pl. 2:29:194, fig. 3). All specimens are from the type locality.

Explanation of Plate 2:29:192

Fig. 1, ♂ RV, ext. lat. (HU.220.T.6.1, 950 µm long); fig. 2, ♀ LV, ext. lat. (HU.220.T.5, 950 µm long).

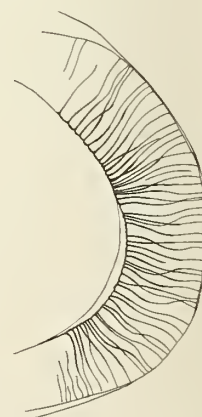
Scale A (250 µm ; ×93), fig. 1; scale B (250 µm ; ×90), fig. 2.

Diagnosis: Large, with many small pits of variable size, becoming larger in the central portion of the valves. Three or four fine ribs are present ventrally, running parallel to the ventral margin. The carapace is strongly inflated posteriorly. The left valve has a pronounced angular hinge ear. Marginal pore canals are numerous, long and simple; a small anterior vestibule is present.

Remarks: This species differs from *A. patagoniensis* sp. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 181-190, 1975) in the large number of pits, the strong posterior inflation and the shape of the hinge ear on the left valve. Unlike *A. patagoniensis* it has only a short range, being restricted to the Oligocene. Dimorphism is very marked, males are longer than females.

Distribution: Known only from well samples N of Peninsula Brunswick and around Seno Skyring, Chile.

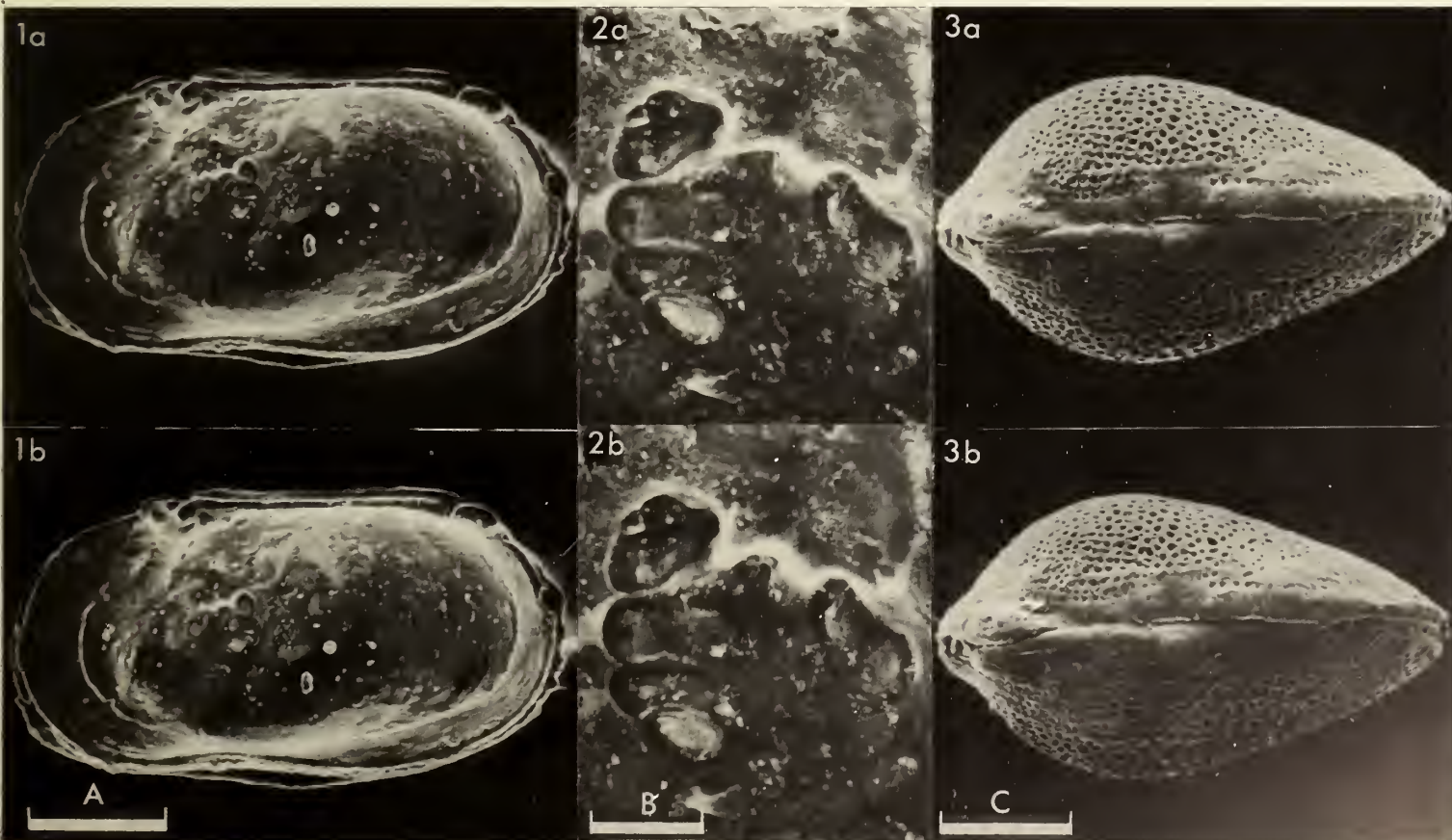
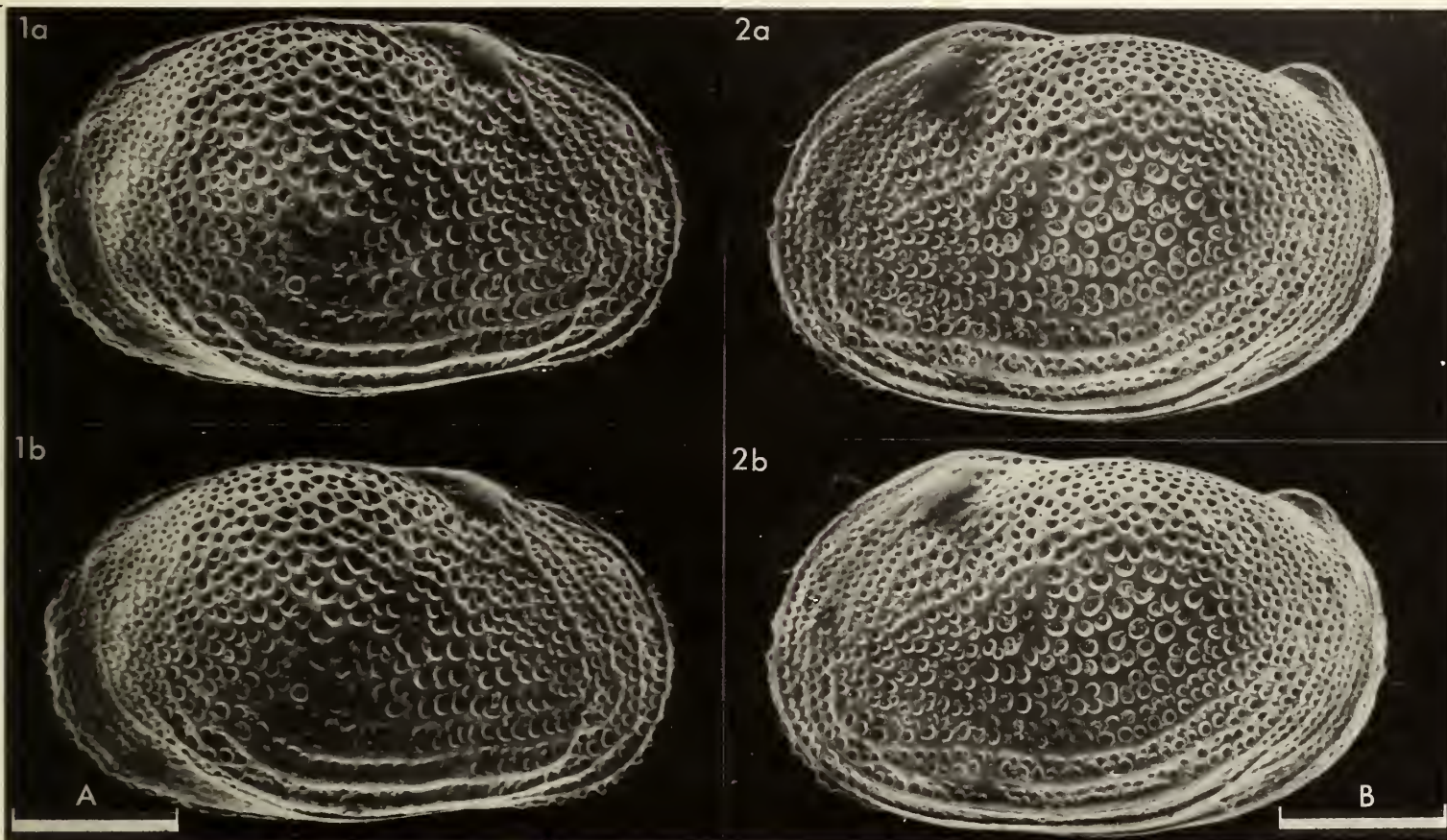
Text-fig. 1. Marginal pore canals (HU.220.T.5).



Explanation of Plate 2:29:194

Fig. 1, ♂ RV, int. lat. (HU.220.T.6.2, 1000 µm long); fig. 2, ♂ LV, int. musc. sc. (HU.220.T.6.3); fig. 3, ♀ car., ext. dors. (HU.220.T.6.4, 980 µm long).

Scale A (250 µm ; ×75), fig. 1; scale B (40 µm ; ×400), fig. 2; scale C (250 µm ; ×70), fig. 3.







ON *ARGENTICYTHERETTA* (*ARGENTICYTHERETTA*) *RIESCOENSIS* ROSE sp. nov.  
by John F. Rose  
(University of Hull, England)

*Argenticytheretta* (*Argenticytheretta*) *riescoensis* sp. nov.

Holotype: University of Hull coll. no. HU.220.T.4, ♀ carapace.

Type locality: Pozo R.1 at 24 m depth, N coast of Isla Riesco, Magallanes Province, Chile; approx. long. 71°50'W, lat. 52°50'S. Grey shale with abundant foraminiferal fauna. The sample comes from near the base of the Tres Brazos Formation; Middle Eocene age (Clarencian). Probably from shelf sea environment.

Derivation of name: From Isla Riesco, Chile.

Figured specimens: University of Hull coll. nos. HU.220.T.7 (♂ RV: Pl. 2:30:196, fig. 1; Pl. 2:30:198, figs. 1-4), HU.220.T.4 (♀ car.: Pl. 2:30:196, fig. 2). Specimen HU.220.T.7 from Pozo R.1 (see type locality), between 289-295 m. HU.220.T.4 from Pozo R.1 at 24 m.

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Explanation of Plate 2:30:196

Fig. 1, ♂ RV, ext. lat. (HU.220.T.7, 810 µm long); fig. 2, ♀ car., ext. lt. lat. (HU.220.T.4, 870 µm long).

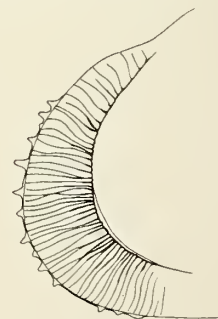
Scale A (200 µm ; ×112), fig. 1; scale B (200 µm ; ×92), fig. 2.

Diagnosis: Valve with numerous small pits arranged in double rows between fine but strongly raised ribs, which become flexuous in the centrodorsal area. Long, simple anterior marginal pore canals and a small anterior vestibule are present.

Remarks: *A. riescoensis* differs from *A. patagoniensis* sp. nov. and *A. gonzalezi* sp. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 181-190, 191-194, 1975) in its stronger ornament, and in being less inflated. Sexual dimorphism is fairly strong, males are longer and thinner than females.

Distribution: *A. riescoensis* has so far only been found at seven different horizons in Pozo R.1, and ranges in age from Middle to Upper Eocene (Brunswickian to Clarencian).

Text-fig. 1. Marginal pore canals (HU.220.T.7).

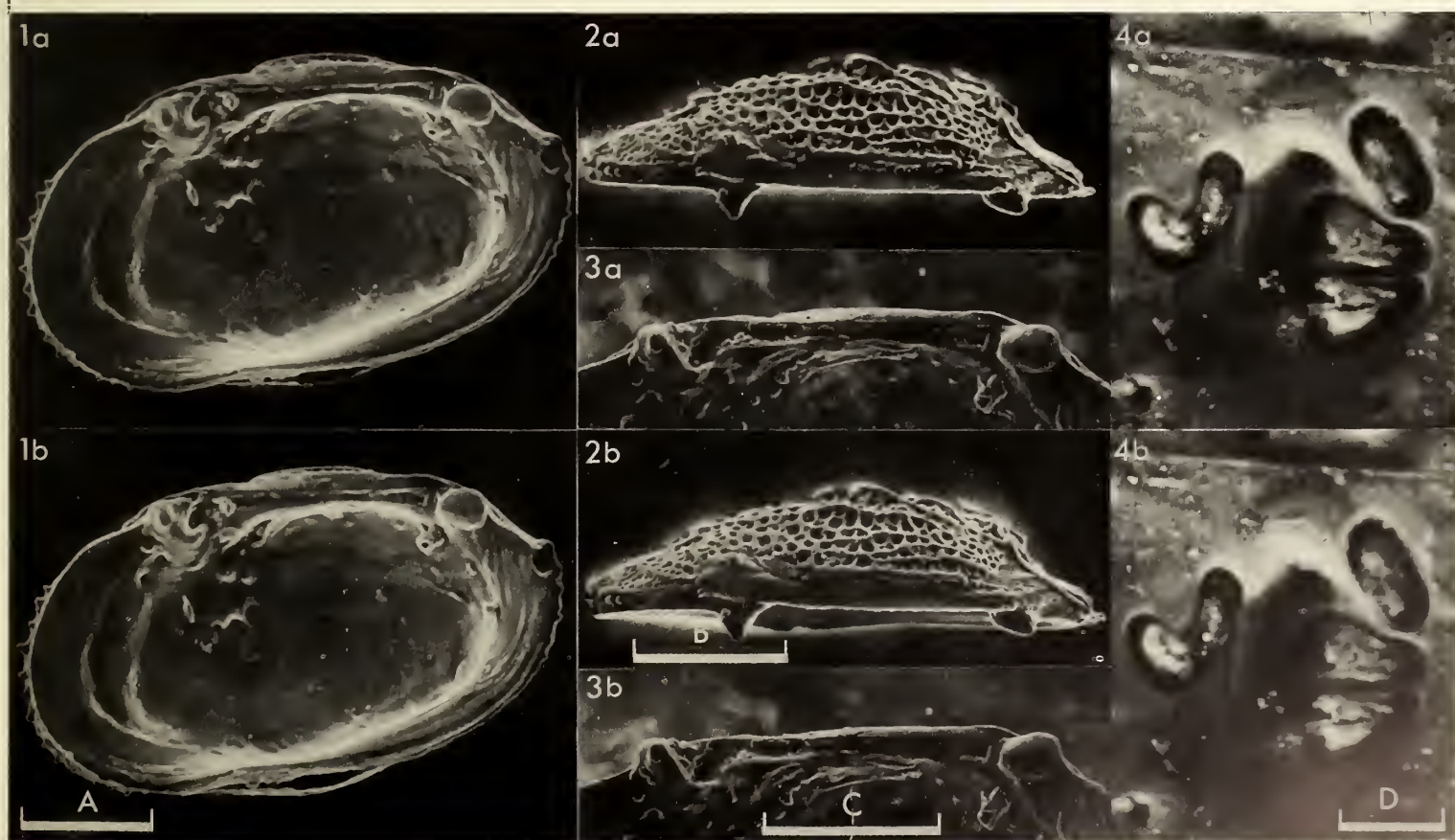
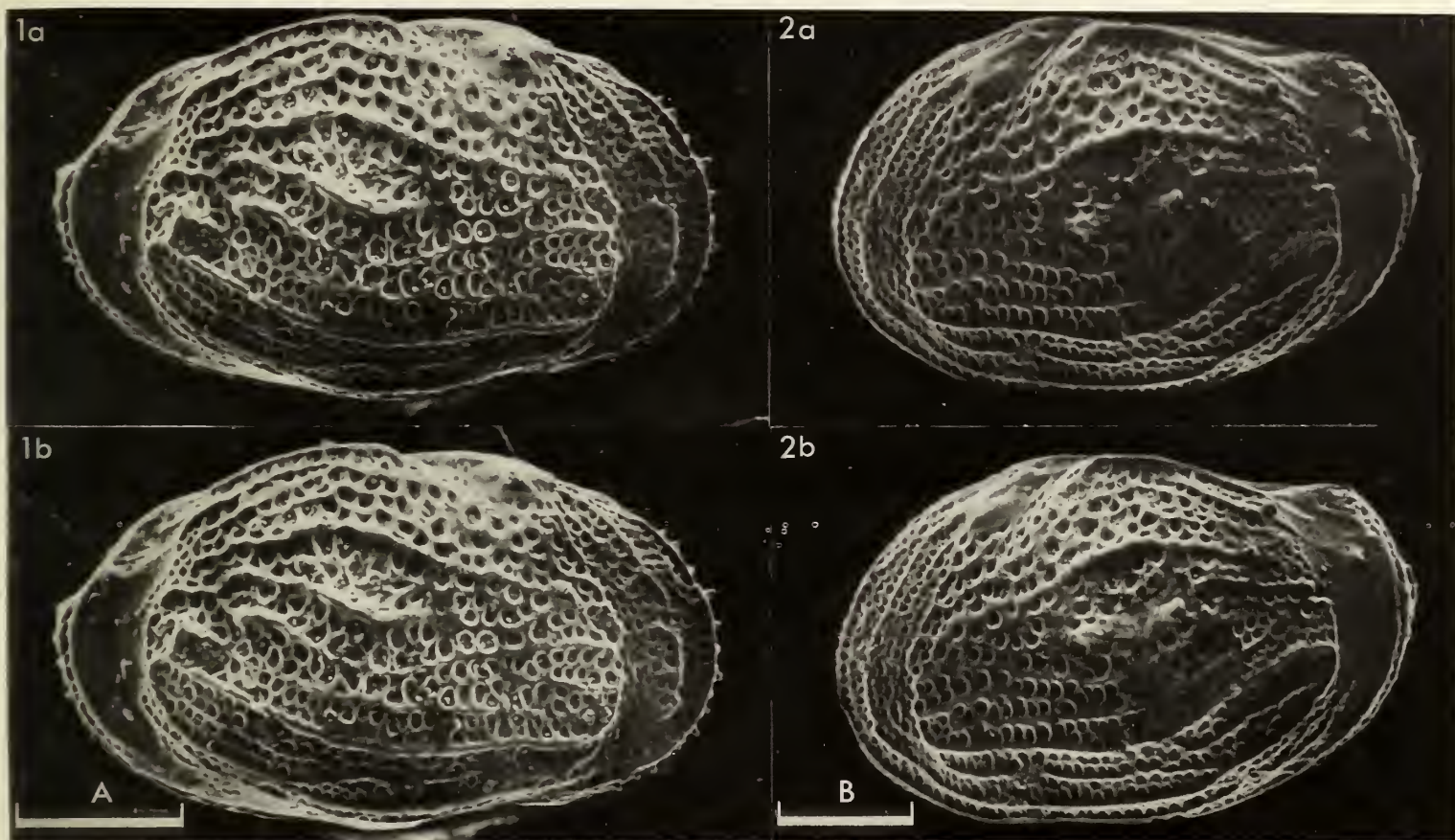


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Explanation of Plate 2:30:198

Figs. 1-4, ♂ RV (HU.220.T.7): fig. 1, int. lat.; fig. 2, ext. dors.; fig. 3, int. lat., hinge; fig. 4, int. musc. sc.

Scale A (200 µm ; ×93), fig. 1; scale B (250 µm ; ×86), fig. 2; scale C (200 µm ; ×125), fig. 3; scale D (40 µm ; ×370), fig. 4.







ON *ARGENTICYTHERETTA* (*ARGENTICYTHERETTA*) *FUEGOENSIS* ROSE sp. nov.  
by John F. Rose  
(University of Hull, England)

*Argenticytheretta* (*Argenticytheretta*) *fuegoensis* sp. nov.

Holotype: University of Hull coll. no. HU.220.T.8, ♂ LV.

Type locality: Cliff section at Brush Lake, Isla Grande, Tierra del Fuego; approx. long. 68°51'W, lat. 53°13'S. Sample TdF.33; olive coloured silty shale, Brush Lake Formation, Lower Miocene (Gaviotian). Abundant ostracod fauna dominated by *Copytus*, that suggests cool, rather shallow conditions.

Derivation of name: From Tierra del Fuego, Chile.

Figured specimens: University of Hull coll. nos. HU.220.T.8 (♂ LV: Pl. 2:31:200, fig. 1), HU.220.T.11 (♀ LV: Pl. 2:31:200, fig. 2), HU.220.T.10.2 (♀ RV: Pl. 2:31:200, fig. 3), HU.220.T.10.3 (♀ LV: Pl. 2:31:202, figs. 1, 4), HU.220.T.9 (♀ LV: Pl. 2:31:202, fig. 2), HU.220.T.11.2 (♂ RV: Pl. 2:31:202, fig. 3).

Explanation of Plate 2:31:200

Fig. 1, ♂ LV (morphotype A), ext. lat. (HU.220.T.8, 870 µm long); fig. 2, ♀ LV (morphotype B), int. musc. sc. (HU.220.T.11); fig. 3, ♀ RV (morphotype A), ext. lat. (HU.220.T.10.2, 850 µm long).

Scale A (250 µm ; ×84), fig. 1; scale B (40 µm ; ×450), fig. 2; scale C (250 µm ; ×86), fig. 3.

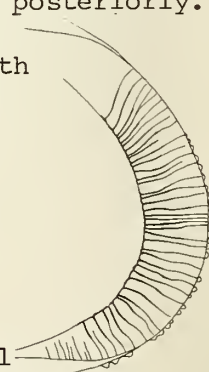
Figured specimens: Specimens from Lower Miocene (Gaviotian & Miradorian), northern Tierra del Fuego. HU.220.T.8 from type locality. HU.220.T.11 & HU.220.T.11.2 (contd.) from Pozo Rio del Oro no. 1 (approx. long. 69°49'W, lat. 52°52'S), between 571-574 m. HU.220.T.10.2 & HU.220.T.10.3 from Pozo San Sebastian no. 1 (approx. long. 68°49'W, lat. 53°16'S); HU.220.T.10.2 between 406-409 m, HU.220.T.10.3 between 610-619 m. HU.220.T.9 from Pozo Sombrero no. 1 (approx. 69°11'W, lat. 52°46'S), between 808-812 m.

Diagnosis: Valves smooth or very finely punctate; punctation stronger posteriorly. Marginal zone rather narrow; no vestibule. Marginal pore canals fairly numerous, straight, simple. Morphotype A: with fine punctation (Pl. 2:31:200, figs. 1, 3). Morphotype B: completely smooth (Pl. 2:31:202, fig. 2).

Remarks: Marginal zone narrower than in *A. patagoniensis* sp. nov., *A. gonzalezi* sp. nov., and *A. riescoensis* sp. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 181-190, 191-194, 195-198, 1975), and marginal pore canals less numerous. Dimorphism: males longer than females.

Distribution: Morphotypes synchronous, but allopatric. Miocene; Tierra del Fuego.

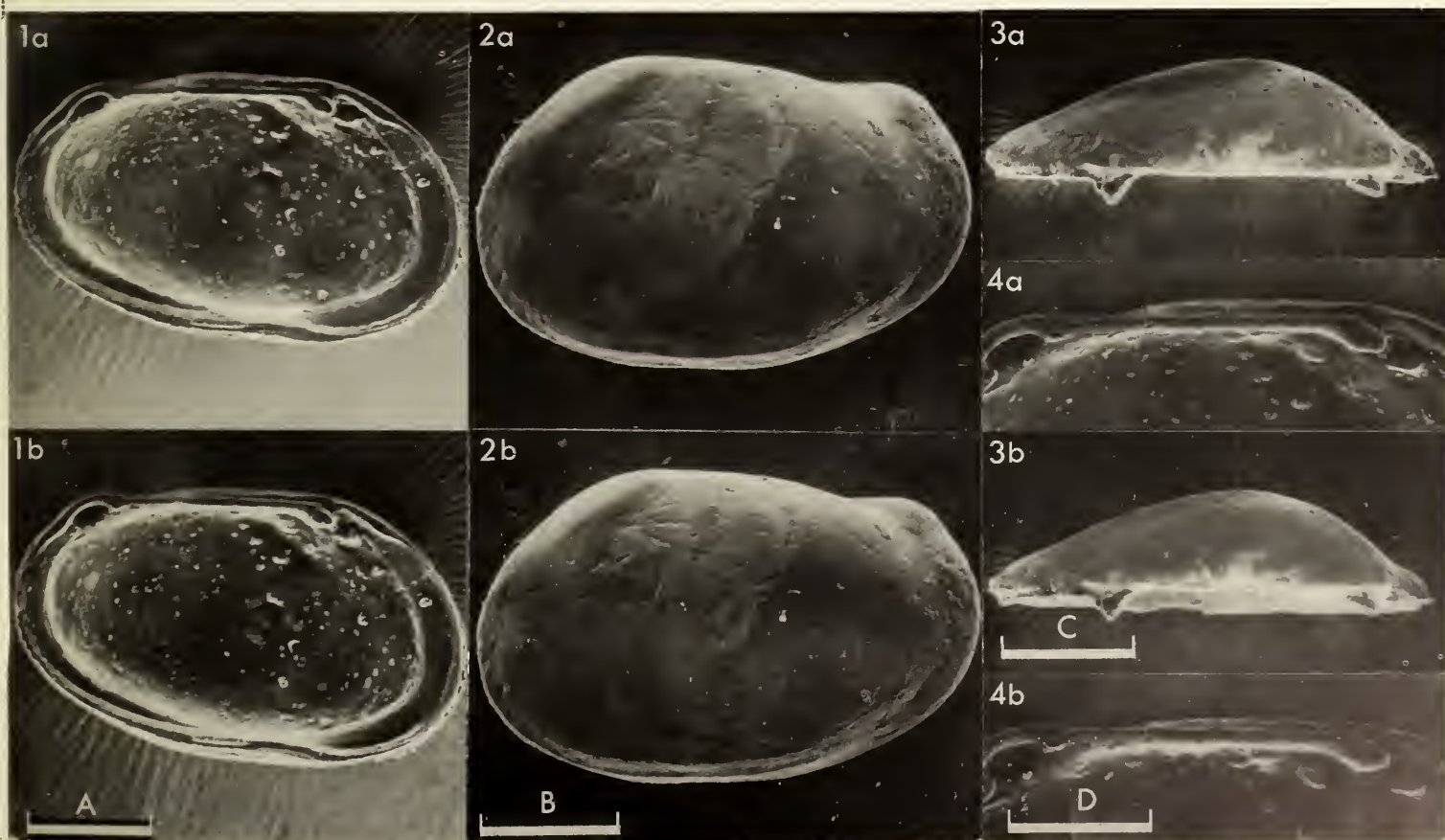
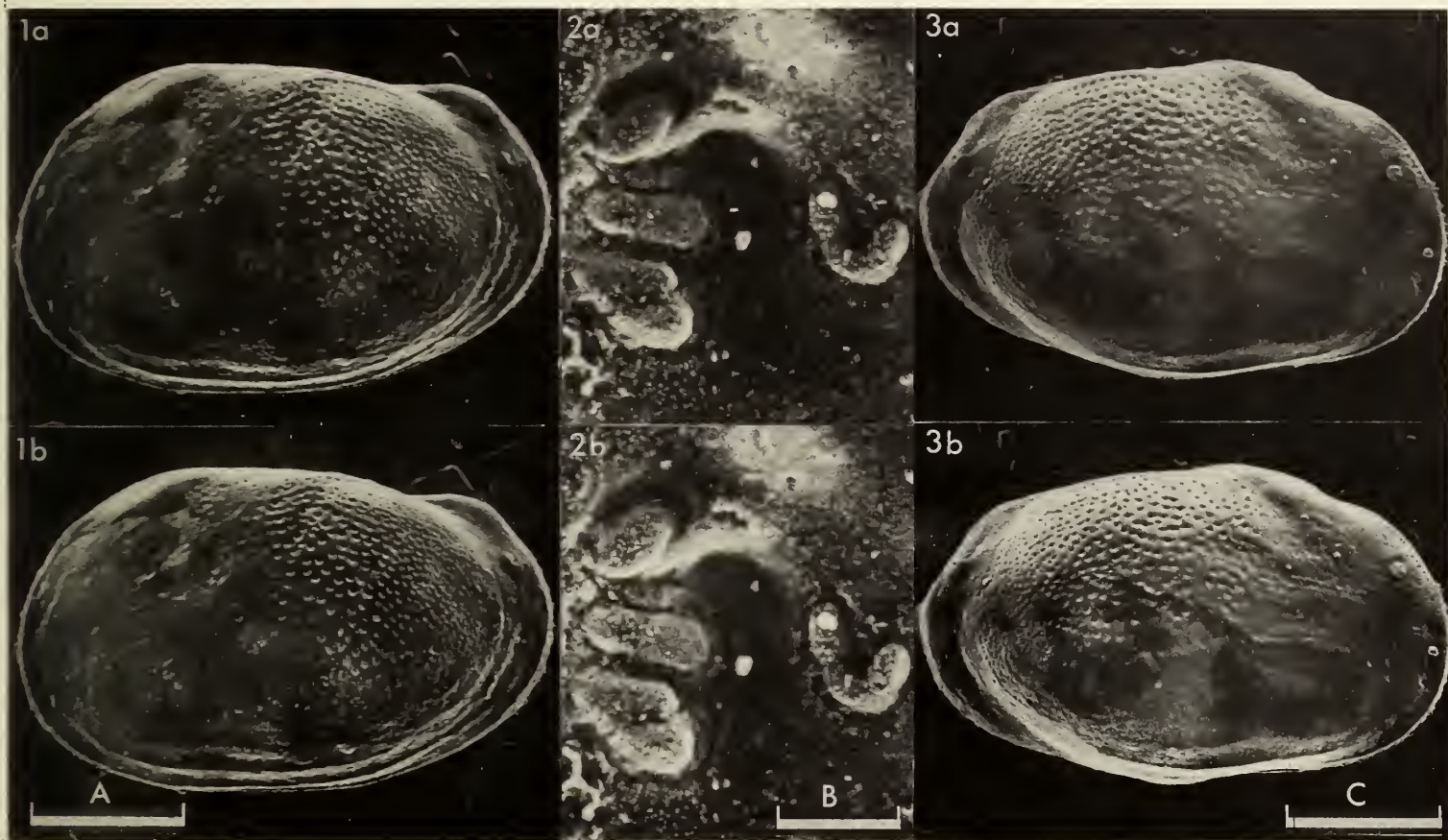
Text-fig. 1. Marginal pore canals (HU.220.T.10.3).



Explanation of Plate 2:31:202

Fig. 1, ♀ LV (morphotype A), int. lat. (HU.220.T.10.3, 900 µm long); fig. 2, ♀ LV (morphotype B), ext. lat. (HU.220.T.9, 870 µm long); fig. 3, ♀ RV (morphotype B), ext. dors. (HU.220.T.11.2, 840 µm long); fig. 4, ♀ LV (morphotype A), int. hinge (HU.220.T.10.3).

Scale A (250 µm ; ×70), fig. 1; scale B (250 µm ; ×78), fig. 2; scale C (250 µm ; ×71), fig. 3; scale D (200 µm ; ×100), fig. 4.







ON *ARGENTICYTHERETTA* (*MAGALLANELLA*) *CHILEANA* ROSE subgen. et sp. nov.  
by John F. Rose  
(University of Hull, England)

Subgenus *MAGALLANELLA* subgen. nov.

Type-species: *Argenticytheretta (Magallanella) chiliana* sp. nov.

Derivation of name: From Magallanes Province, Chile.

Diagnosis: Very short; ♀♀ almost circular. Moderately inflated, maximum width just behind mid-point. Weak eye spot. Marginal canals fairly numerous, long, simple. Asymmetric V-shaped frontal scar; 4 adductors, lower 2 fused.

Remarks: *A. (Magallanella)* differs from *A. (Argenticytheretta)* Rossi de Garcia, 1969 in its more rounded overall shape, its wider marginal zone, and its more asymmetric frontal scar. It differs from *A. (Chilea)* subgen. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 207-210, 1975) in lacking posteroventral rib, in position of maximum inflation (further forward), in details of hinge (more delicate and with denticles of posteromedian swelling less marked), and with rather fewer marginal pore canals. Dimorphism strong; males longer and thinner.

Explanation of Plate 2:32:204

Fig. 1, ♂ car., ext. lt. lat. (HU.220.T.3.1, 840 µm long); fig. 2, ♀ RV, int. musc. sc. (HU.220.T.3.2); fig. 3, ♀ RV, ext. lat. (HU.220.T.3.2, 750 µm long).

Scale A (250 µm ; ×81), fig. 1; scale B (100 µm ; ×515), fig. 2; scale C (250 µm ; ×88), fig. 3.

Holotype: University of Hull coll. no. HU.220.T.2, ♀ carapace.

Type locality: Pozo Posesion no. 1 between 858-863 m depth, Magallanes Province, Chile; approx. long. 68°58'W, lat. 52°16'S. Thin grey shale band within dominantly sandy sequence with microfauna typifying cool shelf seas; Areniscas Arcillocas, Lower Miocene (Miradorian).

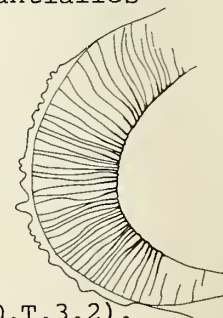
Derivation of name: From southern Chile.

Figured specimens: University of Hull coll. nos. HU.220.T.3.1 (♂ car.: Pl. 2:32:204, fig. 1; Pl. 2:32:206, fig. 2), HU.220.T.3.2 (♀ RV: Pl. 2:32:204, figs. 2, 3; Pl. 2:32:206, figs. 1, 3), HU.220.T.2 (♀ car.: Pl. 2:32:206, fig. 4). HU.220.T.2 from type locality. HU.220.T.3.1 from Pozo Manantiales no. 9 (approx. long. 69°26'W, lat. 52°35'S), 780-804 m; Discordia Shale, Upper Oligocene (Rosarian). HU.220.T.3.2 from sample F.239, N coast of Bahía Inutil (approx. long. 69°49'W, lat. 53°22'S), Tierra del Fuego; Santa Clara Formation, Upper Oligocene (Miradorian).

Diagnosis: 4 or 5 weak ribs, each separated by 2 rows of small pits, traverse centre.

Remarks: A second *Magallanella* species exists in the lower Oligocene of southern Chile.

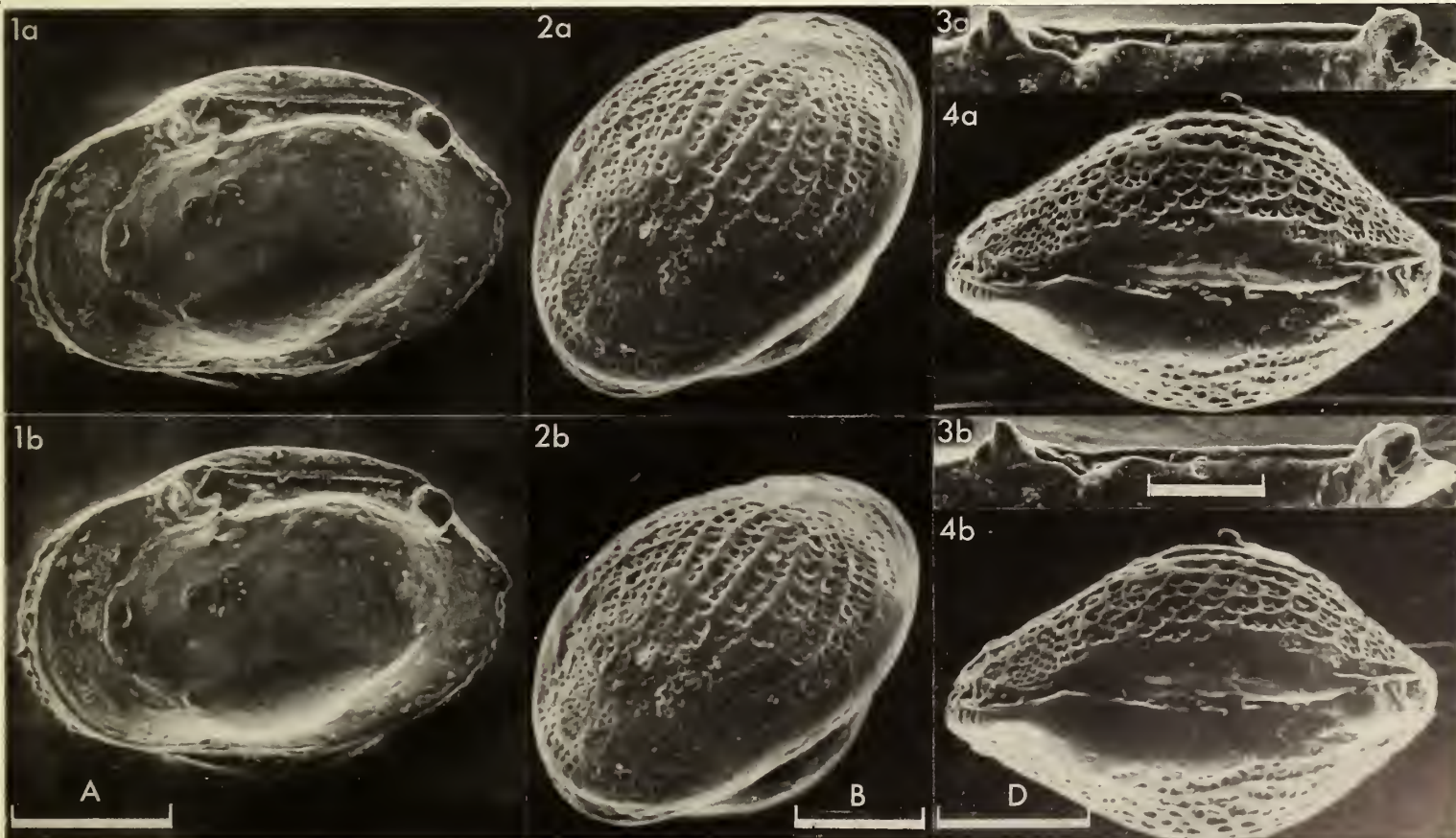
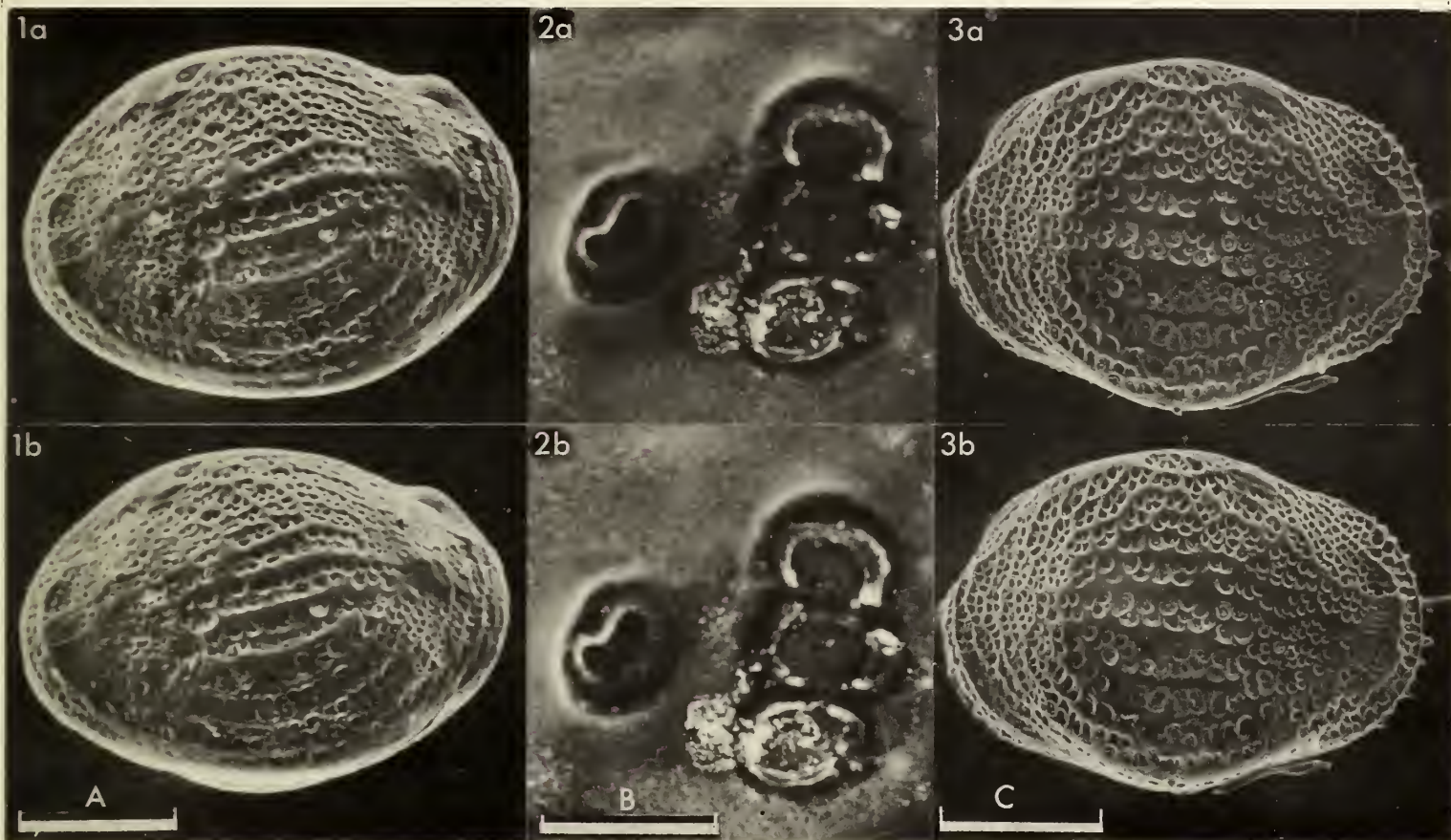
Text-fig. 1.  
Marginal pore  
canals (HU.220.T.3.2).



Explanation of Plate 2:32:206

Fig. 1, ♀ RV, int. lat. (HU.220.T.3.2); fig. 2, ♂ car., ant. vent. obl. (HU.220.T.3.1); fig. 3, ♀ RV, int. lat., hinge (HU.220.T.3.2); fig. 4, ♀ car., ext. dors. (HU.220.T.2).

Scale A (250 µm ; ×91), fig. 1; scale B (250 µm ; ×71), fig. 2; scale C (100 µm ; ×147), fig. 3; scale D (250 µm ; ×84), fig. 4.







ON *ARGENTICYTHERETTA* (*CHILEA*) *BRUNSWICKENSIS* ROSE subgen. et sp. nov.  
by John F. Rose  
(University of Hull, England)

Subgenus *CHILEA* subgen. nov.

Type-species: *Argenticytheretta* (*Chilea*) *brunswickensis* sp. nov.

Derivation of name: From southern Chile.

**Diagnosis:** Of cytherettid shape, with weak eye tubercle. A strong posteroventral rib is developed at the point of maximum inflation. The marginal zone is fairly wide with a regular inner margin. Marginal pore canals are straight and simple, and a small vestibule is developed.

**Remarks:** Dimorphism: males slightly longer and thinner. *A. (Chilea)* differs from *A. (Argenticytheretta)* Rossi de Garcia, 1969, and *A. (Magallanella)* subgen. nov. (see *Stereo-Atlas of Ostracod Shells*, vol. 2, pt. 3, pp. 203-206, 1975) by the presence of the strong posteroventral inflation and its associated rib, and by its more delicate hinge, in which the postero-median element bears 5-6 sharply defined denticles.

#### Explanation of Plate 2:33:208

Fig. 1, ♀ LV, ext. lat. (HU.220.T.1, 610 µm long); fig. 2, ♀ LV, ant. vent. obl. (HU.220.T.1); fig. 3, ♀ car., ext. rt. lat. (ENAP specimen, 610 µm long).

Scale A (250 µm ; ×100), fig. 1; scale B (250 µm ; ×110), fig. 2; scale C (250 µm ; ×106), fig. 3.

**Holotype:** University of Hull, coll. no. HU.220.T.1, ♀ LV.

**Type locality:** Pozo Tres Brazos no. 1 between 1290-1293 m depth, Peninsula Brunswick, Magallanes Province, Chile; approx. long. 70°75'W, lat. 53°14'S. Agua Fresca Shale, Lower Eocene (Manzanian). Fine grey shale with abundant foraminiferal fauna suggesting cool water outer shelf conditions.

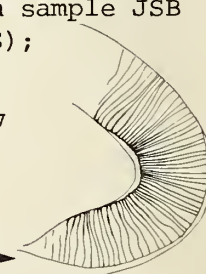
**Derivation of name:** From Peninsula Brunswick, Magallanes Province, Chile.

**Figured specimens:** University of Hull coll. no. HU.220.T.1 (♀ LV: Pl. 2:33:208, figs. 1, 2; Pl. 2:33:210, figs. 1-4); one specimen lodged with Empresa Nacional del Petroleo (ENAP) Magallanes, Punta Arenas, Chile (♀ car.: Pl. 2:33:208, fig. 3). HU.220.T.1 from type locality. ENAP specimen from sample JSB 82, Tres Brazos Valley (approx. long. 71°4'W, lat. 53°16'S); Tres Brazos Formation, Upper Eocene (Clarencian).

**Diagnosis:** Marked flexuous central rib present, and outlined by a row of pits which become stronger posteriorly.

**Distribution:** So far found at five localities in Peninsula Brunswick, Chile; Lower to Upper Eocene (Manzanian to Moritzian).

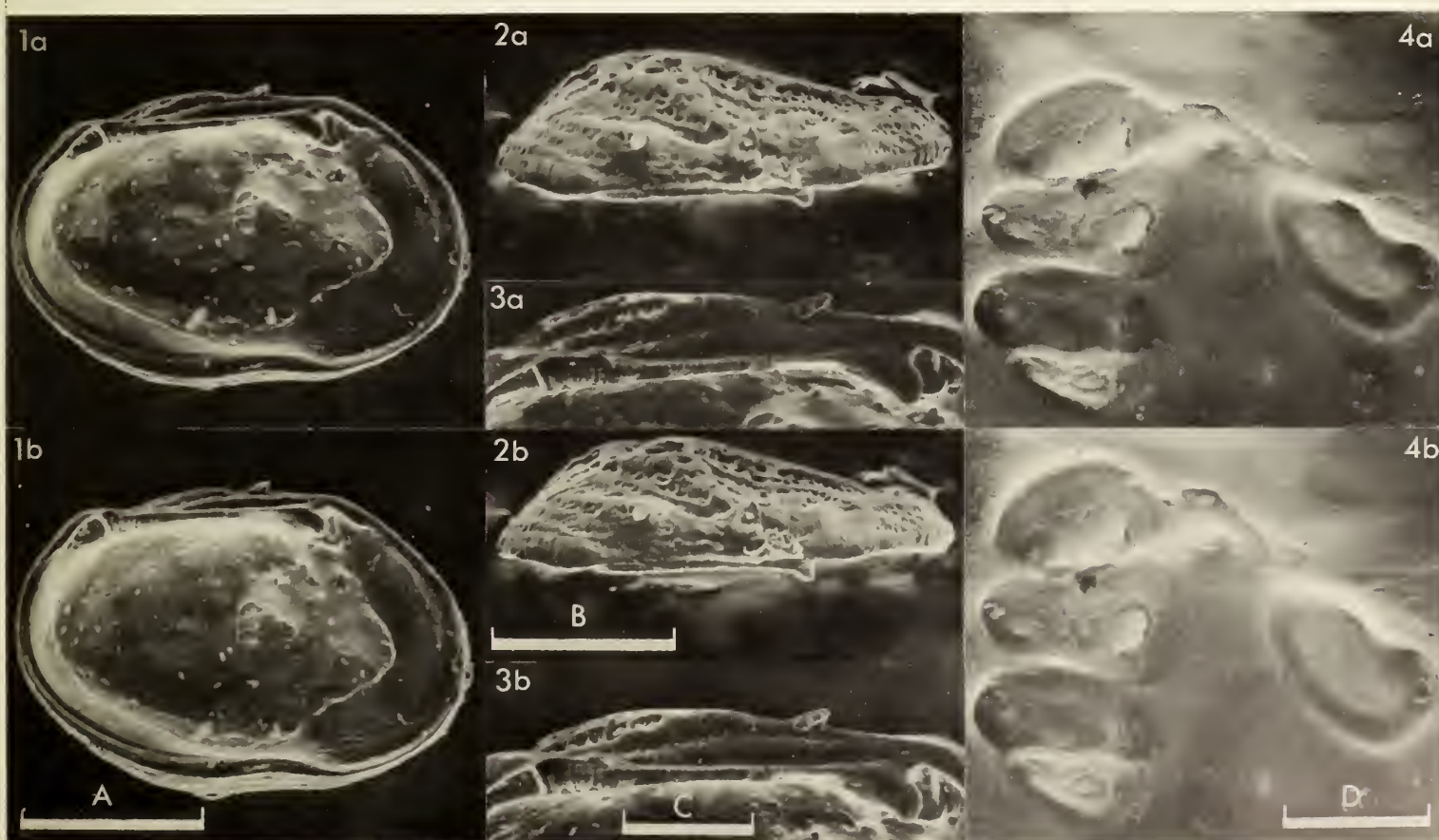
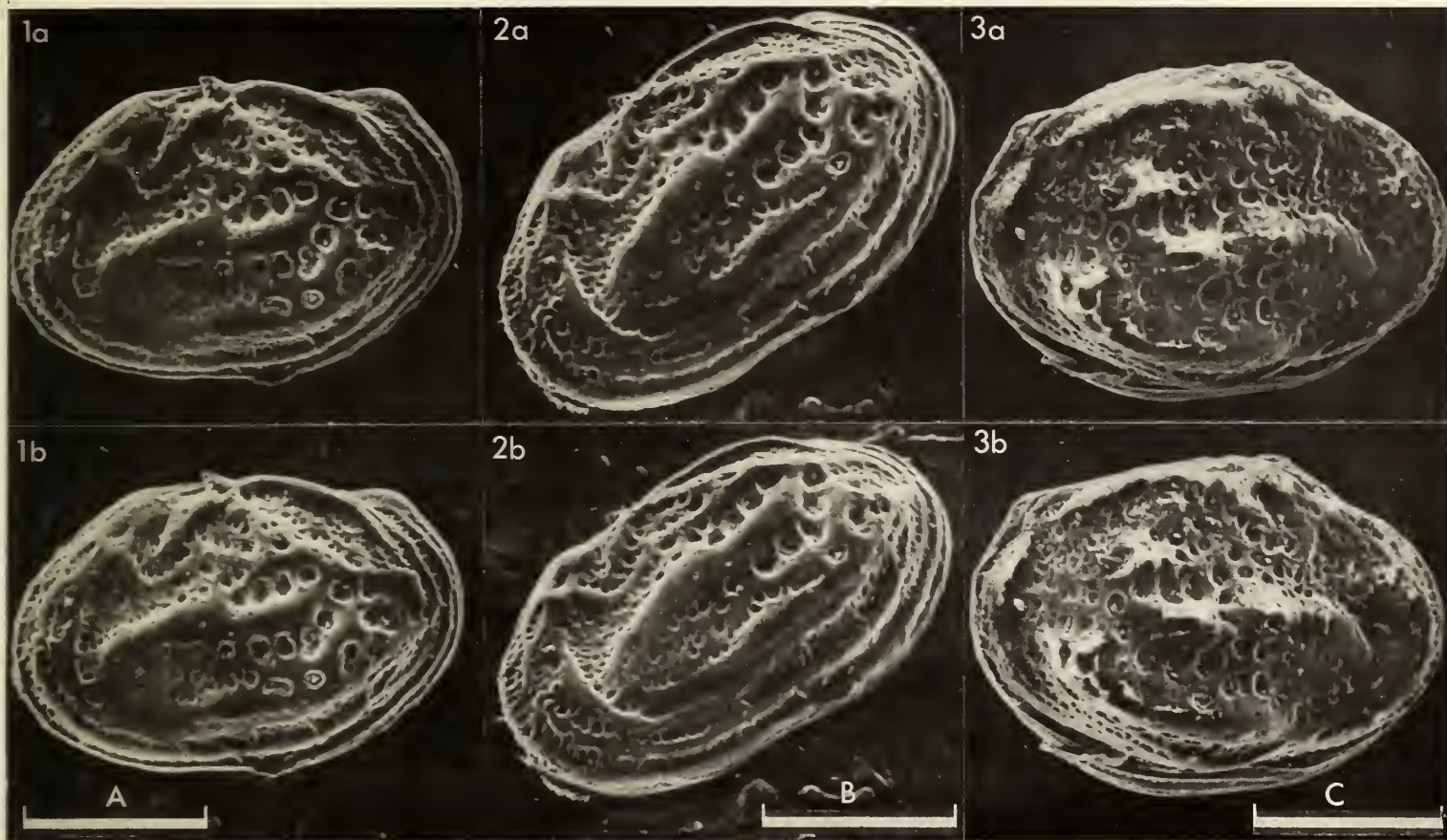
Text-fig. 1. Marginal pore canals (HU.220.T.1).



#### Explanation of Plate 2:33:210

Figs. 1-4, ♀ LV (HU.220.T.1): fig. 1, int. lat.; fig. 2, ext. dors.; fig. 3, int. lat., hinge; fig. 4, int. musc. sc.

Scale A (250 µm ; ×100), fig. 1; scale B (250 µm ; ×100), fig. 2; scale C (100 µm ; ×180), fig. 3; scale D (25 µm ; ×800), fig. 4.







ON *HORNIBROOKELLA ANNA* (LIENENKLAUS)  
by Ali A. F. Al-Furaih  
(University of Leicester, England)

Genus *HORNIBROOKELLA* Moos, 1965

Type-species (by original designation): *Cythere anna* Lienenklaus, 1894

**Remarks:** Moos (1965) used the adductor muscle scar pattern as a diagnostic feature for *Hornibrookella* but the present study reveals that this pattern is variable. Not only do specimens vary one from the other (see Pl. 2:34:214, fig. 3 and text-fig. 1), but even in one specimen the upper of the four adductor scars may be divided in one valve and undivided in the other.

*Hornibrookella anna* (Lienenklaus, 1894)

- 1894 *Cythere anna* sp. nov. E. Lienenklaus, Z. dt. geol. Ges., vol. 46, no. 1, p. 209, pl. 14, figs. 10a-c.  
non 1901 *Cythere anna* Lienenklaus; J. G. Egger, Abh. bayr. Akad. Wiss., vol. 21, p. 439, pl. 6, figs. 27, 28.  
1965 *Quadracythere (Hornibrookella) anna* (Lienenklaus); B. Moos, Geol. Jber., vol. 82, p. 596, pl. 34, figs. 1-4.

Explanation of Plate 2:34:212

Fig. 1, RV ext. lat. (IO 5240, 690 µm long); fig. 2, LV ext. lat. (IO 5241, 646 µm long).  
Scale A (250 µm ; ×130), fig. 1; scale B (250 µm ; ×138), fig. 2.

Stereo-Atlas of Ostracod Shells, 2:34:213

*Hornibrookella anna* (3 of 4)

**Neotype:** A left valve, no. TK-Nr. 5550 proposed by Moos (op. cit.). Collections of Niedersächsisches Landesamt für Bodenforschung, Hannover, W Germany.

**Type locality:** Brandhorst near Bünde, Germany; approx. long. 8°35'E, lat. 52°12'N.

**Figured specimens:** Brit. Mus. (Nat. Hist.) nos. IO 5240 (RV: Pl. 2:34:212, fig. 1), IO 5241 (LV: Pl. 2:34:212, fig. 2; Pl. 2:34:214, figs. 1, 3), IO 5242 (RV: Pl. 2:34:214, fig. 2). All from the type locality; sample no. 40671, collection of Niedersächsisches Landesamt für Bodenforschung, Hannover.

**Diagnosis:** Longish rectangular, faintly arched outline. Surface reticulate with subordinate ribbing. Posterodorsal corner with short downward curving projection.

**Distribution:** Known so far only from the Lower Oligocene of W Germany.

**Acknowledgement:** The author wishes to express his gratitude to Dr. B. Moos for providing material and making valuable suggestions.

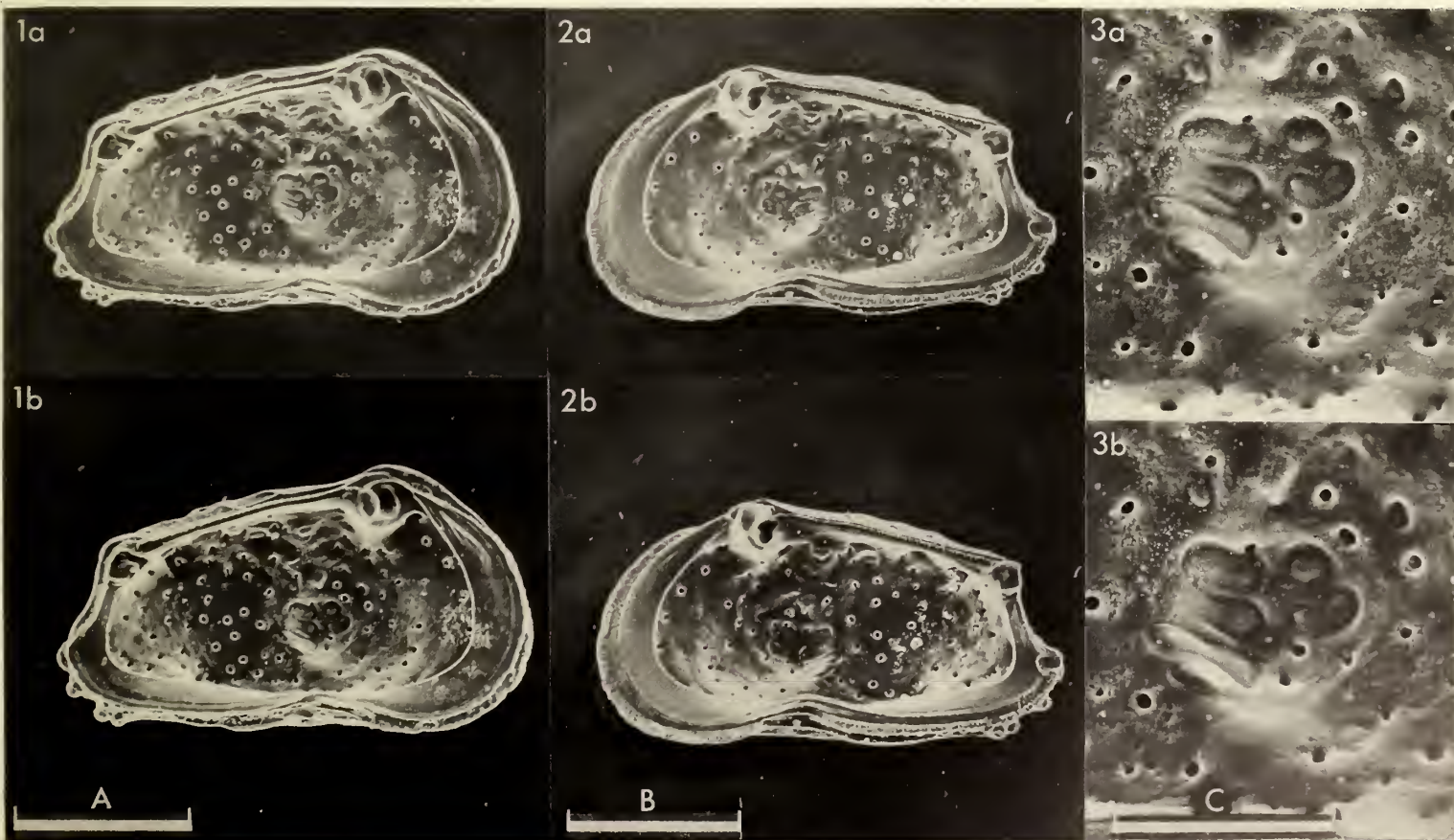
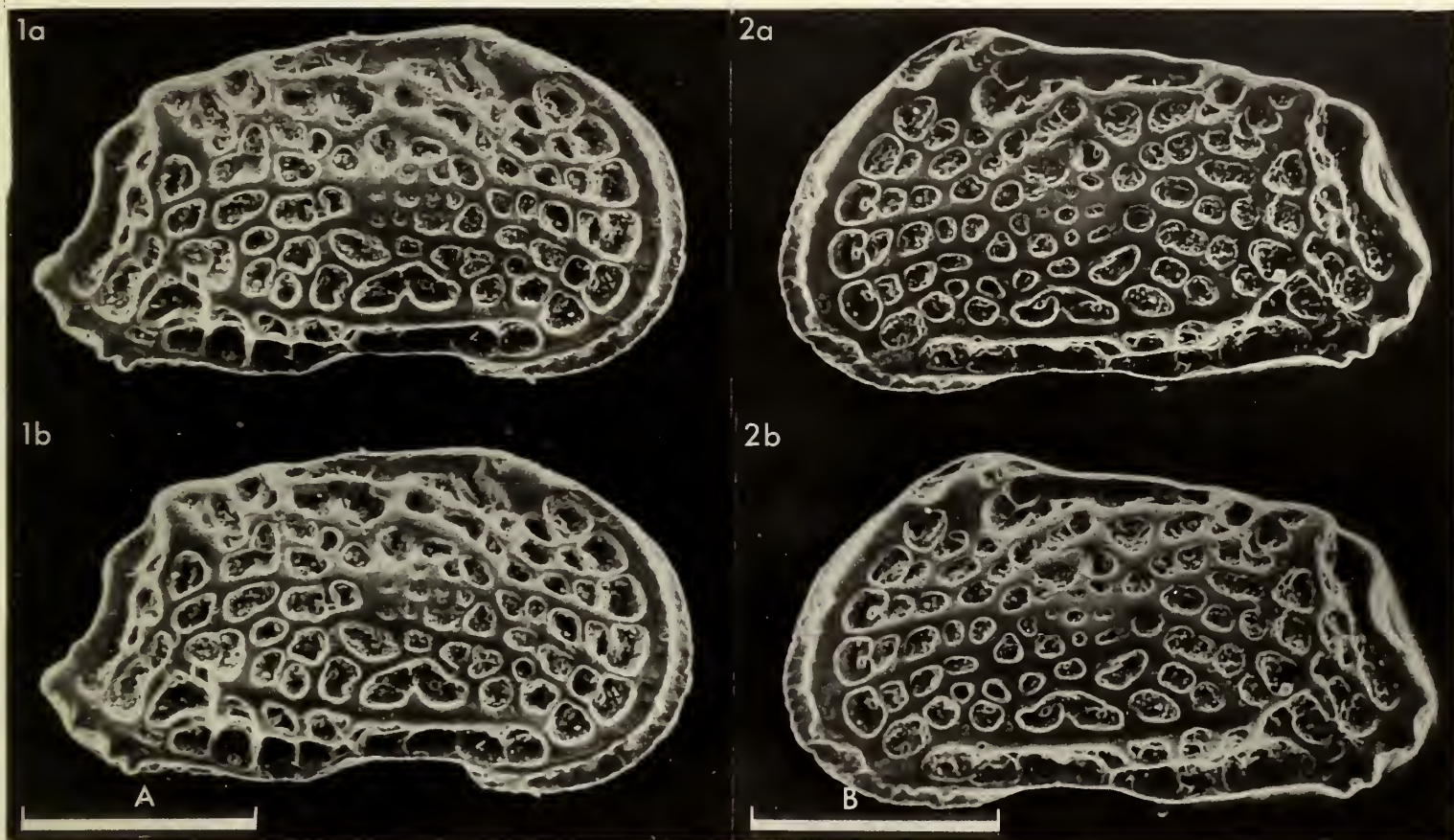


1a Left valve 1b Right valve  
Text-fig. 1. Muscle scar pattern in two separate specimens of *H. anna*.

Explanation of Plate 2:34:214

Fig. 1, LV int. lat. (IO 5241); fig. 2, RV int. lat. (IO 5242, 658 µm long); fig. 3, LV int. musc. sc. (IO 5241).

Scale A (250 µm ; ×101), fig. 1; scale B (250 µm ; ×97), fig. 2; scale C (100 µm ; ×303), fig. 3.







ON *KELLETTINA CARNICA* RUGGIERI AND SIVETER sp. nov.  
by Giuliano Ruggieri and David J. Siveter  
(University of Palermo, Italy and University of Leicester, England)

*Kellettina carnica* sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) IO 6301, RV.

Type locality: About 150 m E of the trigonometrical point at the top of Mount Auernig, in the Carnic Alps, N Italy; approx. long. 13°17'E, lat. 46°33'N. Black limestones with silicified fossils; uppermost Carboniferous (Donetzian). Horizon the same as that indicated in Geyer (1897, *Jb. geol. Bundesanst., Wien*, vol. 46 [for 1896], no. 1. p. 161, fig. 3) as bed no. 20.

Derivation of name: From Carnic Alps, the region of type locality, northern Italy.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 6301 (RV: Pl. 2:35:216, figs. 1-3; Pl. 2:35:218, figs. 1-4), IO 6302 (LV: Pl. 2:35:220, figs. 1, 2), IO 6303 (LV: Pl. 2:35:222, fig. 1), IO 6304 (RV: Pl. 2:35:222, fig. 2). All figured specimens were obtained from the type locality.

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Explanation of Plate 2:35:216

Figs. 1-3, RV (IO 6301, 1000 µm long): fig. 1, ant.; fig. 2, ext. lat.; fig. 3, post.

Scale A (250 µm ; ×85), figs. 1-3.

Diagnosis: A species of *Kellettina* with well developed velar and marginal structures. Velum perforate, edge joined to domicilium throughout length by a system of narrow, strut-like connections. Frill-like marginal structure similarly perforate. Reticulation fine on most of valve surface, slightly coarser on nodes. Valves preplete. Cristae absent.

Remarks: *Kellettina carnica* forms part of a silicified ostracod fauna including the genus *Gortanella* Ruggieri (1966, *Riv. ital. Paleont. Stratigr.*, vol. 72, no. 1, pp. 1-8). The delicate marginal structure of *K. carnica* is not, in the material available, found complete, though like the velar structure it too appears to have a continuous distal edge (see Pl. 2:35:216, fig. 2). The shape (crescent-like anteriorly and posteriorly) and extent (entire and, except medioventrally, very wide) of the frill-like marginal structure recalls that described elsewhere from the beyrichiacean genus *Craspedobolbina* Kummerow, 1924 (see Martinsson, 1962, *Bull. geol. Inst. Univ. Uppsala*, vol. XLI, p. 74).

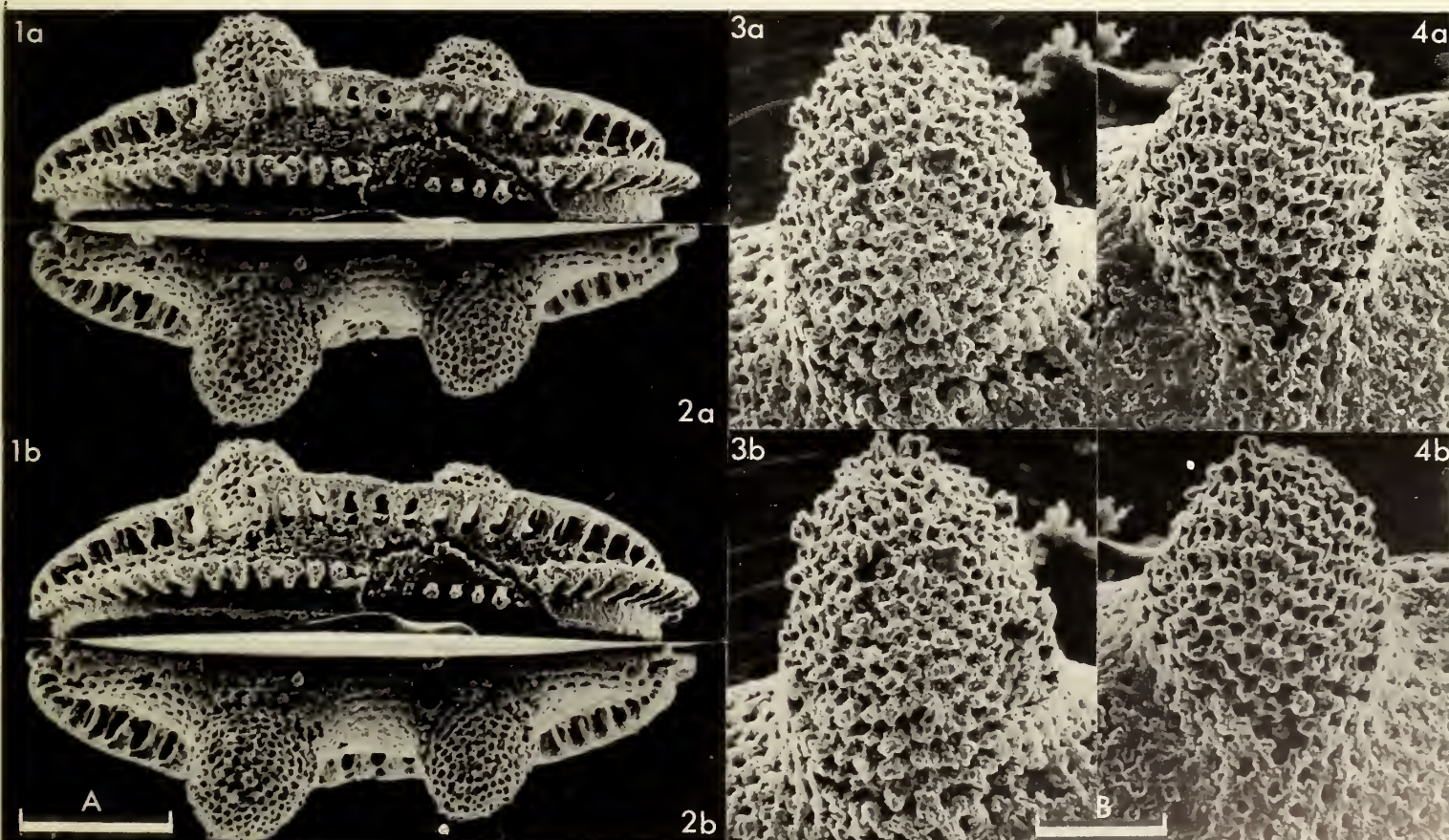
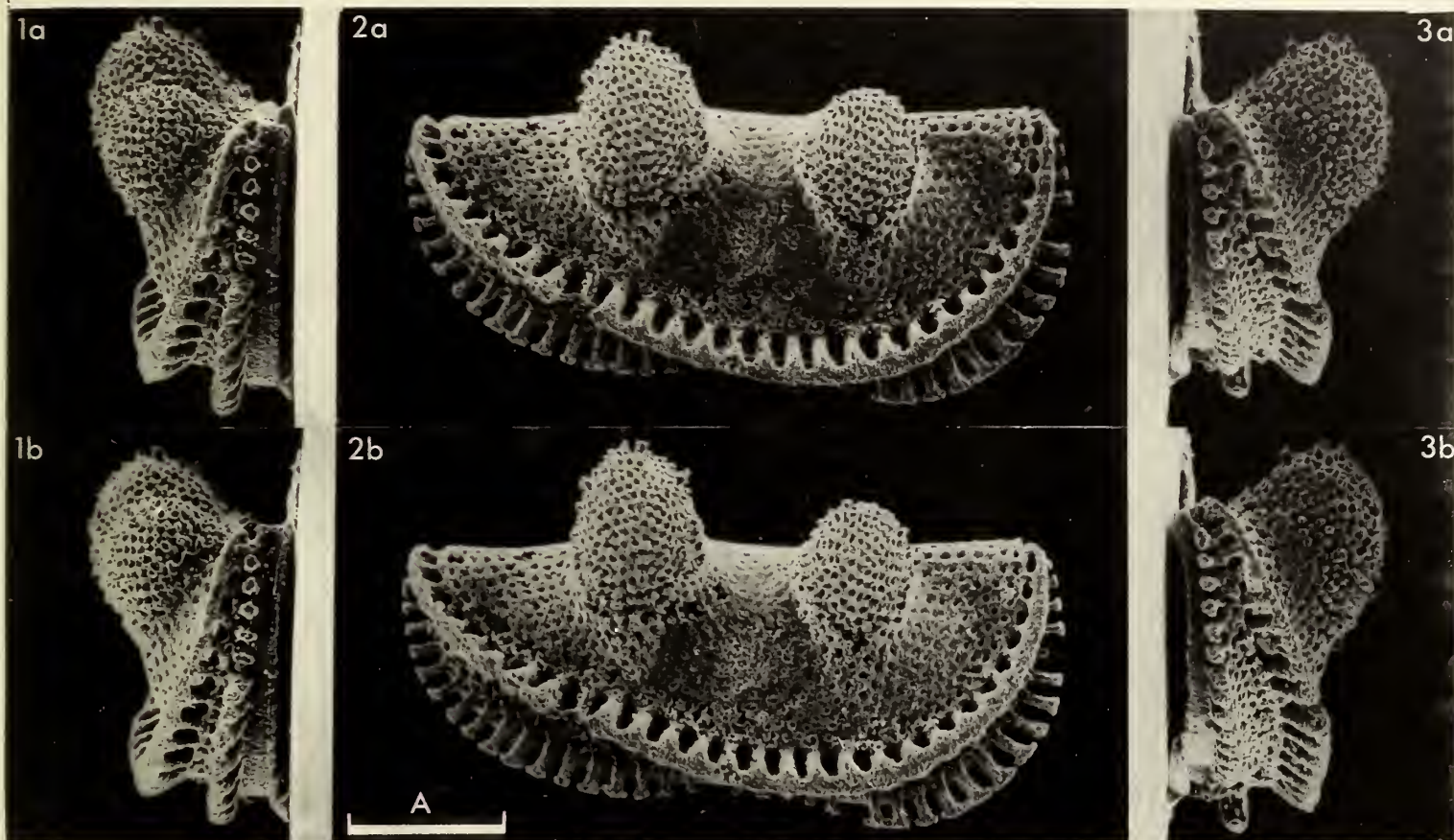
The holotype and paratypes (U.S.N.M. 85449, 85449a-h) of the American type-species of *Kellettina* [*K. robusta* (Kellett, 1933)] have been examined; radial 'ribbing' is visible externally throughout the length of both the marginal and velar structures (see also *Kellettina vidriensis* Hamilton, 1942 in Sohn, 1954, *Prof. Pap. U. S. geol. Surv.*, 264-A, p. 8), but the structures themselves are not perforate.

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Explanation of Plate 2:35:218

Figs. 1-4, RV (IO 6301): fig. 1, vent.; fig. 2, dors.; fig. 3, detail of ornament, post. node; fig. 4, detail of ornament, ant. node.

Scale A (250 µm ; ×85), figs. 1, 2; scale B (100 µm ; ×180), figs. 3, 4.







Remarks (contd.): The morphology of the velar and marginal structures of *K. carnica* is alone sufficient to distinguish this species from all known congeneric taxa. *K. carnica* further differs from other *Kellettina* species by its obvious preplete shape, by the conspicuous height of its nodes above the hinge line, and by its rather wide sulcus. Unlike *K. robusta*, *K. carnica* has no crista (sensu Martinsson, op. cit., p. 78).

The hinge structure of the right valve in *K. carnica* consists of a prominent dorsal groove bordered ventrally along its entire length by a somewhat narrower ridge. At each cardinal corner this ridge links directly to a small, simple tooth (see Pl. 2:35:222, fig. 2). The left valve has corresponding terminal sockets and, dorsally, a well developed ridge. Below the latter in each of the left valves available, the hinge structure (like the internal surfaces of all the valves) is unfortunately masked by a coating of secondary origin; it is here that one might expect to find a fine groove to accommodate the ridge of the right valve. The apparent crenulations along this ventral part of the left hinge shown in Pl. 2:35:220, fig. 1 have not been confirmed in other specimens and are considered to be artefacts formed by this secondary 'lining'.

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Explanation of Plate 2:35:220

Figs. 1, 2, LV (IO 6302, 975  $\mu$ m long): fig. 1, int. lat.; fig. 2, ext. lat.

Scale A (250  $\mu$ m ;  $\times 85$ ), figs. 1, 2.

Distribution: So far known only from the type locality, northern Italy.

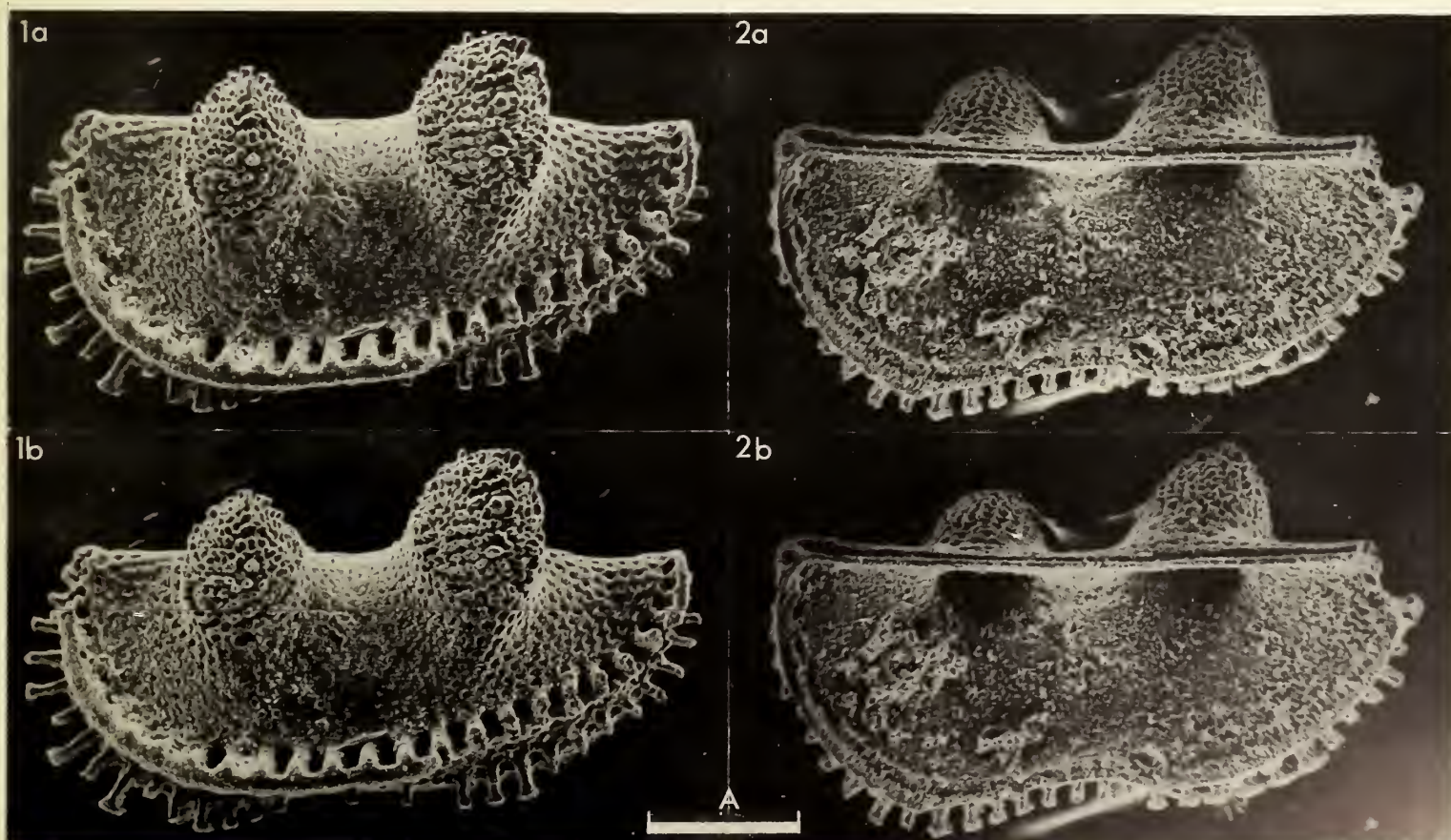
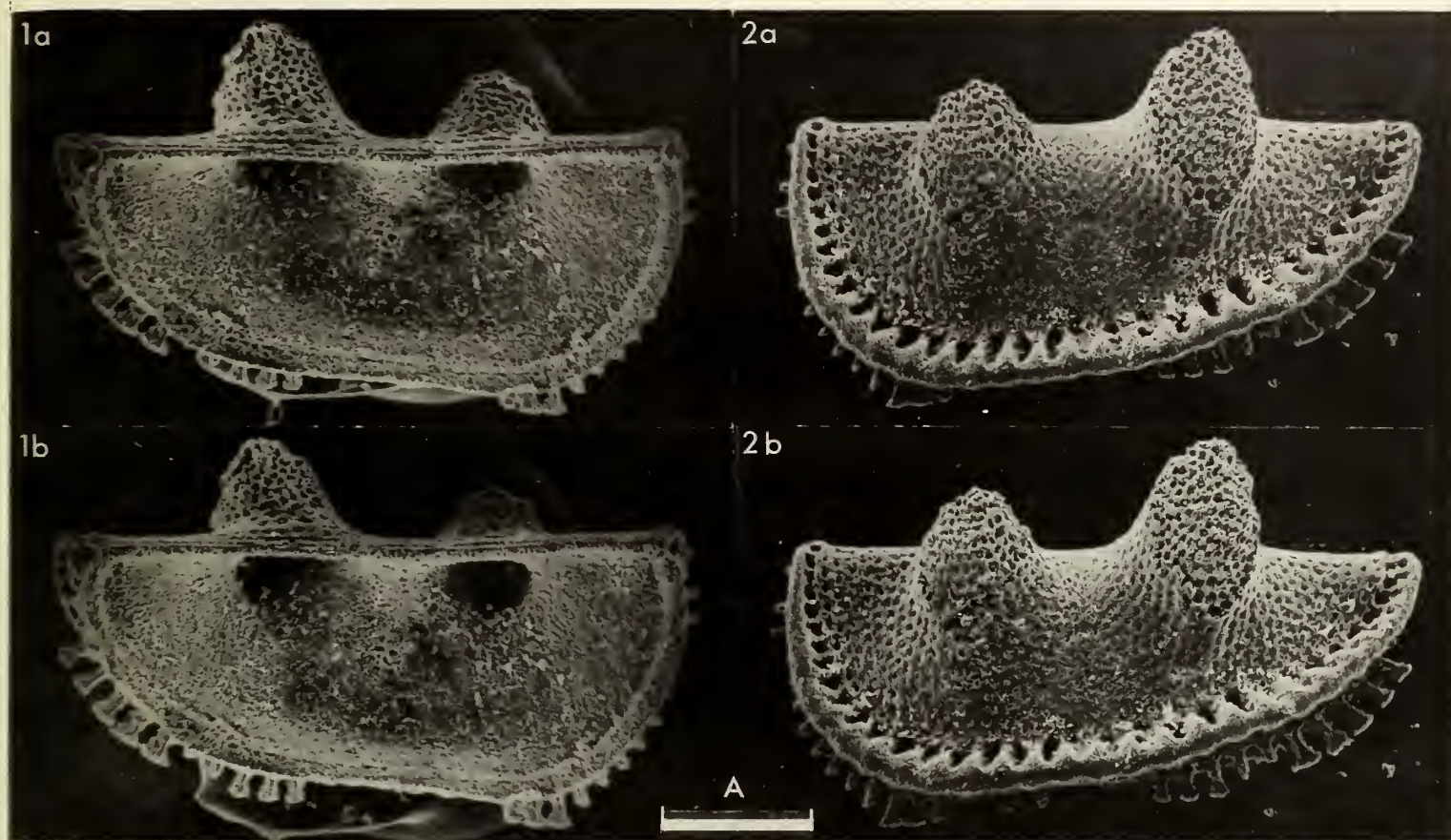
Acknowledgements: Thanks are due to Drs. R. H. Benson and F. J. Collier, Smithsonian Institution, Washington, for the loan of the type material of *Kellettina robusta* (Kellett).

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Explanation of Plate 2:35:222

Fig. 1, LV ext. lat. (IO 6303, 985  $\mu$ m long); fig. 2, RV int. lat. (IO 6304, 975  $\mu$ m long).

Scale A (250  $\mu$ m ;  $\times 85$ ), figs. 1, 2.







STEREO-ATLAS OF OSTRACOD SHELLS  
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2:35:215-222	On <i>Kellettina carnica</i> Ruggieri and Siveter sp. nov.; by G. Ruggieri and David J. Siveter	(£0.90)

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